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ABSTRACT

As one in a series of test item collections developed by the Assessment and Evaluation Unit of the Directorate of Studies, items of value from past tests are made available to teachers for the construction of unit tests, term examinations or as a basis for class discussion. Each collection is reviewed for content validity and reliability. The test items meet syllabus content and aims best suited to multiple choice questions, but teachers are meant to base the use of the test items on student ability and the particular program objectives. Test items on plants, animals, soils and miscellaneous topics in agricultural education are presented with additional items from science and geography item banks. A master key is provided with guidelines for constructing a test. Many items are illustrated by tables, maps, diagrams and drawings. (CM)

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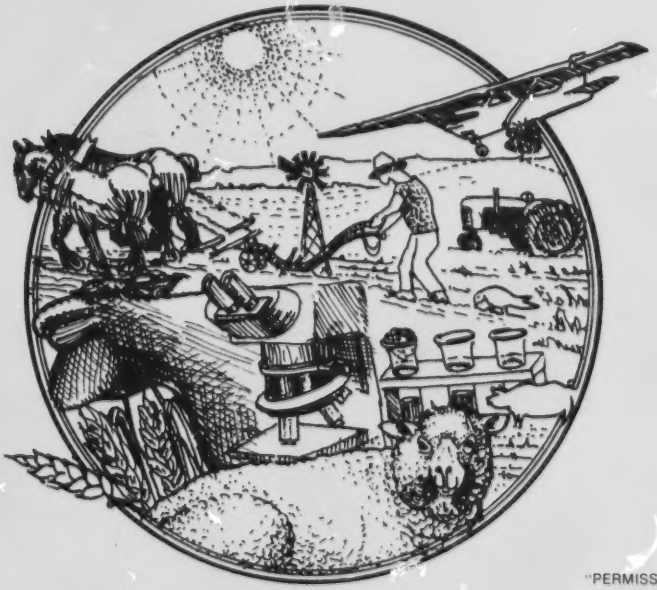
AGRICULTURE

LIBRARY OF TEST ITEMS



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AGRICULTURE

LIBRARY OF TEST ITEMS

INTRODUCTION:

This collection has been prepared with three main purposes in mind:

1. To make available to all Agriculture teachers those items from "past papers" (either examination or Reference Test) which are of value; and

2. To make those items available in a form better suited to reproduction on school duplicating equipment; and

3. To identify areas of good and bad coverage of the Syllabus, so that the gaps may be filled.

The items in this collection have nearly all appeared in previous examination papers and/or Reference Tests, and many will be familiar to teachers. The items have been checked for obvious construction faults and typographical errors, retyped in a clear type-face, and most of the diagrams have been redrawn.

Many familiar items will be found to be absent from this collection. This is usually because the results of previous use suggest that the item was inefficient, or because a group of practising Agriculture teachers felt that the item was unsatisfactory.

Items have been included which are relevant to small areas of the state: teachers in other areas are perfectly free to leave such items out. A few items from the Geography and Science collections have also been included.

Using this item collection

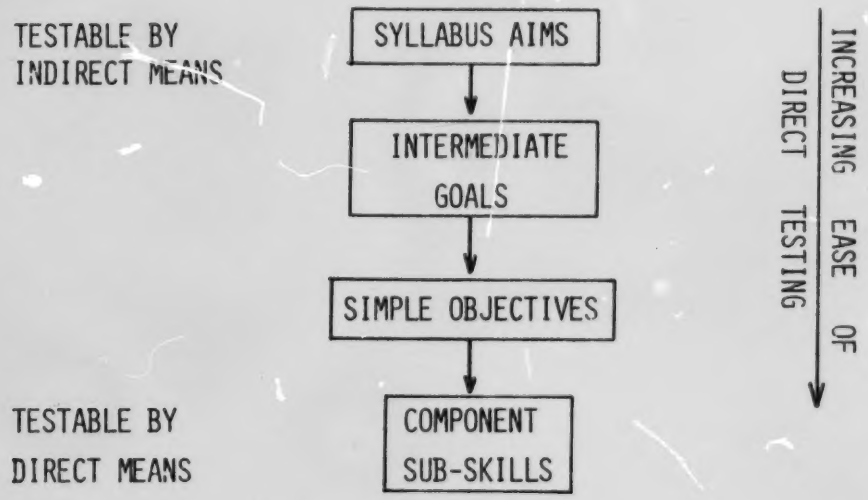
Two copies, punched for ring-binding, are being sent to each school - one for cutting up to produce "printing masters", and another to be left intact as a master file. If the cut-up items are used carefully and stored suitably, they should be able to be used many times for making printing masters. (See "Preparation of Printing Masters"). It is suggested that large envelopes be bound into the ring-binders to store cut-up items.

With similar items grouped together, it will be possible for teachers to utilise complete pages of items as printed.

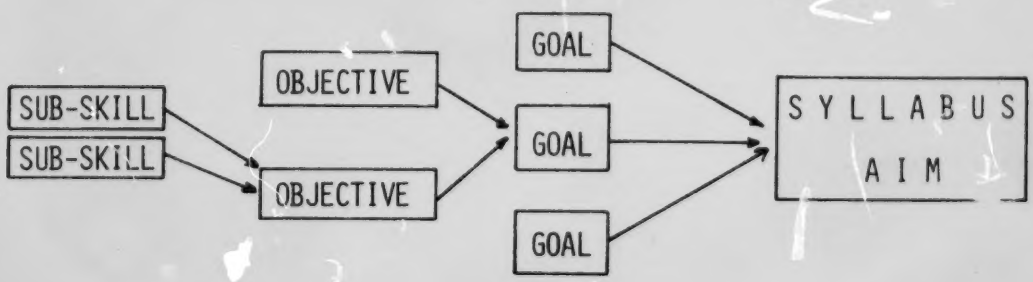
Preparing the test:

1. <u>The identification of objectives and content</u>

Teachers frequently speak of the "testing of aims", or more sensibly, "testing for the achievement of aims". While aims must be achieved if a course of teaching is to be judged effective, this achievement will *normally* be slow. This slowness derives from the fact that most aims involve the acquisition of a number of skills.



Thus the point which teachers should consider is not so much the aims to be tested as the *aims-based objectives* and the *aims-based component sub-skills* which when added together will make up the aim.



2. Construction of a balanced test

Once the relevant aims have been reduced to manageable objectives, it is possible to construct a test grid. This should be a statement of intentions only, and as such, be modified by developments as the test is prepared. Here is an example of a simplified grid which might be drawn up for a unit on ruminant animals. This is not intended to be a definitive grid and should not be used in real life.

"Ruminant animals" - test outline

	Knowledge (8)	Practical Skills (5)	Interpretation of Data, Graphs or Pictures (3)	Problem Solving (4)
Ruminant Digestion (5)	3	-	1	1
Ruminant Nutrition (7)	2	1	2	2
Husbandry Ruminants (3)	1	2	-	-
Diseases of Ruminants (5)	2	2	-	1

The problem for the teacher now becomes one of selecting and/or writing twenty test items to fit the specification. As the test takes shape, it may become apparent that the available item collections do not supply sufficient items of the right kinds. In such a situation, it is suggested that teachers write suitable questions, either in multiple choice form or in some other form, such as "short answer" questions. Unless this attempt is made, there is a risk that teachers will allow the item collections to become the main determinants of the curriculum.

In the event that items can neither be found nor written to fit the test grid it may become necessary to change the grid to fit what is possible. In such a case, the deleted portions of the grid represent areas of learning which have been identified as important: assessment by other means should be considered. Possibly practical work or assignments could contribute information on such areas.

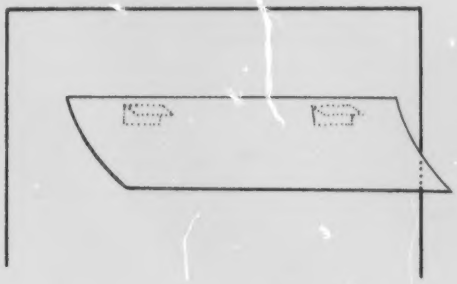
3. Preparation of printing masters

This method is recommended as it allows the prepared master to pass through a typewriter for the addition of page and question numbers etc., and prevents the electric scanner "reading" sticky tape patches and top edges of cut items.

1. Cut out items, cutting right across the page. Always cut *very close to* and *below* the lines which separate questions.

2. Type your test heading on a blank page.

3. Fix question 1 in position, "stamp-hinge" style:



4. Slide the top edge of question 2 under the bottom edge of question 1, and position question 2 correctly.

5. Holding question 2 in position, lift the bottom edge of question 1 and tape question 2 in position, so that when question 1 is allowed to sit flat again, it completely covers the tape used to hold question 2. Question 2 should be fastened by its top edge only.

6. Stick question 3 in place as described for question 2 in (4) and (5) above.

7. Repeat until page 1 is full.

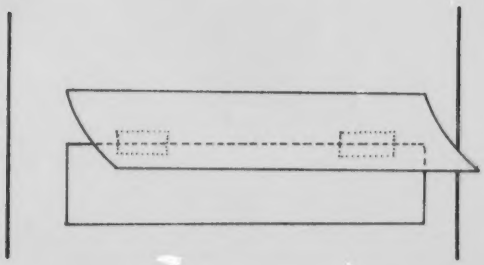
8. Complete pages 2, 3 etc., until all items are positioned.

9. Type or hand write question numbers down the left-hand side.

10. Check that the key (correct response) has been covered in each case. If a *thermal* copier is used, one piece of masking tape or four pieces of adhesive cellulose tape (e.g. "Sellotape") will prevent the key being copied. It may still be read on the original, and will still copy on a *light* copier ("Gestefax", "Thermofax" etc.). A correcting fluid such as "Liquid Paper" is recommended for light copiers, but not for thermal copiers.

11. Make the stencils, being careful to use the correct settings on the machine.

12. If, in step 5, only a narrow strip of sticky tape actually contacts the top of each item, it should be possible to separate tape and item for storage of items. This is shown in the diagram on the next page.



Each item has been marked with the key (correct answer: A, B, C or D), as has been done with the other subject collections. The next volume of the Library will include pre-tested material which may be accompanied by additional information.

* * * * * *

Many areas of the Agriculture Syllabus lend themselves to testing using methods other than multiple choice items. It is almost impossible to assess "interests and attitudes" using multiple choice items and it is very difficult to assess "skills" by this means. These areas are more suited to testing using restricted response items, practical tests and mastery tests.

It is anticipated that these types of items will be produced for Agriculture in the near future.

Comments, criticisms and suggestions from teachers are welcome. All correspondence should be addressed to:

The Subject Officer (Agriculture),
School Certificate Development Unit,
Directorate of Studies,
Box 33, G.P.O.,
SYDNEY. 2001.

AGRICULTURE LIBRARY OF TEST ITEM. VOLUME 1

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The items in this collection are roughly divided according to subject matter or source. The division is as follows:

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A000 - Animals ... ... Page 37 and Page 89.

S000 - Soils ... ... Page 54

M000 - Miscellaneous ... ... Page 65

SC000 - Items drawn from the Science Item Bank ... Page 74

G000 - Items drawn from the Geography Item Bank ... Page 86

Items have been indexed under subject headings for ease of location and have been cross-referenced where appropriate. Some items only relate loosely to subject headings to which they have been cross-referenced. This is to allow for different approaches to a topic.

Items have been drawn from both the Geography and Science Libraries of Test Items. Care should be taken when using these items to check with the other departments to avoid duplication of items.

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Agricultural Services	M027 SC005
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Animal Behaviour	A025 A080
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Animal Husbandry	A001 A010 A011 A012 A014 A016 A017 A018 A019 A020 A021 A025 A027 A033 A036 A037 A043 A044 A047 A053 A054 A055 A082 A084 A085
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Agriculture Library of Test Items Volume 1
Master Key.

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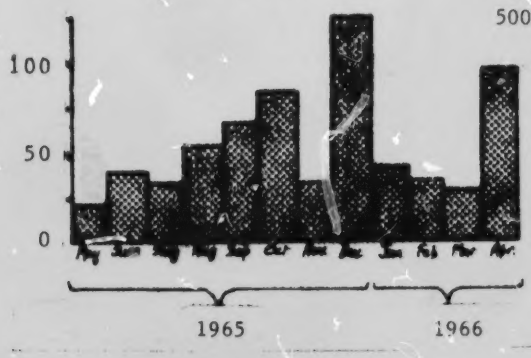
G008 A

PLANTS

See also P051-P053

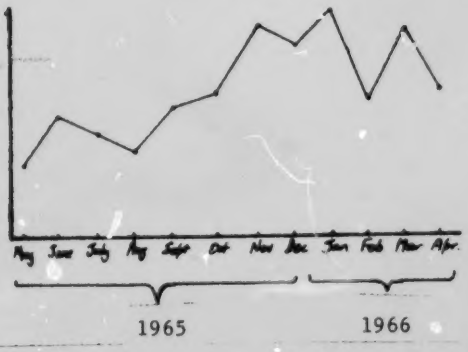
The next six questions refer to these two graphs.

Graph 1



This is a histogram showing the monthly rainfall (in millimetres per month) at Trangie Research Station over one year (from May 1965 to April 1966)

Graph 2



This shows the growth pattern of lucerne (in kilograms of dry matter per hectare) growing at Trangie Research Station over the same one year period (May 1965 to April 1966)

Graph 2 shows that lucerne at Trangie is

A. late spring and summer growing.
B. winter growing.
C. uniform in growth throughout the year.
D. capable of growth throughout the year but especially in the winter.

A.

P001

Lucerne growth at Trangie in the period May to September is poor. The most likely cause of this would be

A. shortage of water.
B. ineffective nodulation.
C. low air and soil temperatures.
D. cloudy weather conditions.

C.

P002

When the Trangie lucerne crop was being established, lime pelleted seed mixed with *Rhizobium* inoculum was used. This is done to

A. inoculate the seed against soil-borne diseases.
B. correct a calcium deficiency in the soil.
C. encourage effective nodulation of the lucerne crop.
D. lower the soil pH so that nodulation will take place.

C.

P003

When this lucerne is made into hay, it is usual to cut the crop when about 10 per cent is in flower because

A. lucerne is then at the correct height for cutting.
B. this ensures that bees can pollinate the flowers.
C. the plant is excellent roughage at this stage.
D. the plant contains a high proportion of protein and has had time to build up the food reserves in its roots.

D.

P004

This set of questions continues on the next page.

The next two questions refer to the graphs on the previous page.

Suppose no rain fell at Trangie in the period May 1965 to April 1966. The lucerne would then

A. die quickly owing to water shortage.
B. survive longer than other legumes owing to its tap root system.
C. show a uniform growth production throughout the period.
D. reduce its transpiration rate.

B. P005

If the lucerne became infested with cape weed and skeleton weed in August, you would expect growth to be

A. less because the weeds are competing with the lucerne for moisture and light.
B. not affected by the weeds.
C. greater because the weeds are living in symbiosis with the lucerne.
D. beneficial because there would be more green feed for the livestock to eat.

A. P006

The next two questions refer to this table which shows the effect of seed treatments on lucerne nodulation when this crop was grown in an acid soil.

Effect of Lime and Seed Pelleting on Nodulation of Lucerne, Grown in an Acid Soil.

Treatment	Percentage Nodulation
1. Unpelleted	6.1
2. Lime Pelleted	90.9
3. Phosphate/dolomite pelleted	21.8

Treatment 2 (lime pelleting of lucerne seed) has resulted in the greatest percentage nodulation (90.9 per cent) probably because it

A. lowers the soil pH allowing *Rhizobia* on the seed to survive and multiply in the soil.
B. raises the soil pH to allow *Rhizobia* on the seed to survive and multiply in the soil.
C. provides nutrients for seed germination.
D. destroys soil inhabiting plant pathogens.

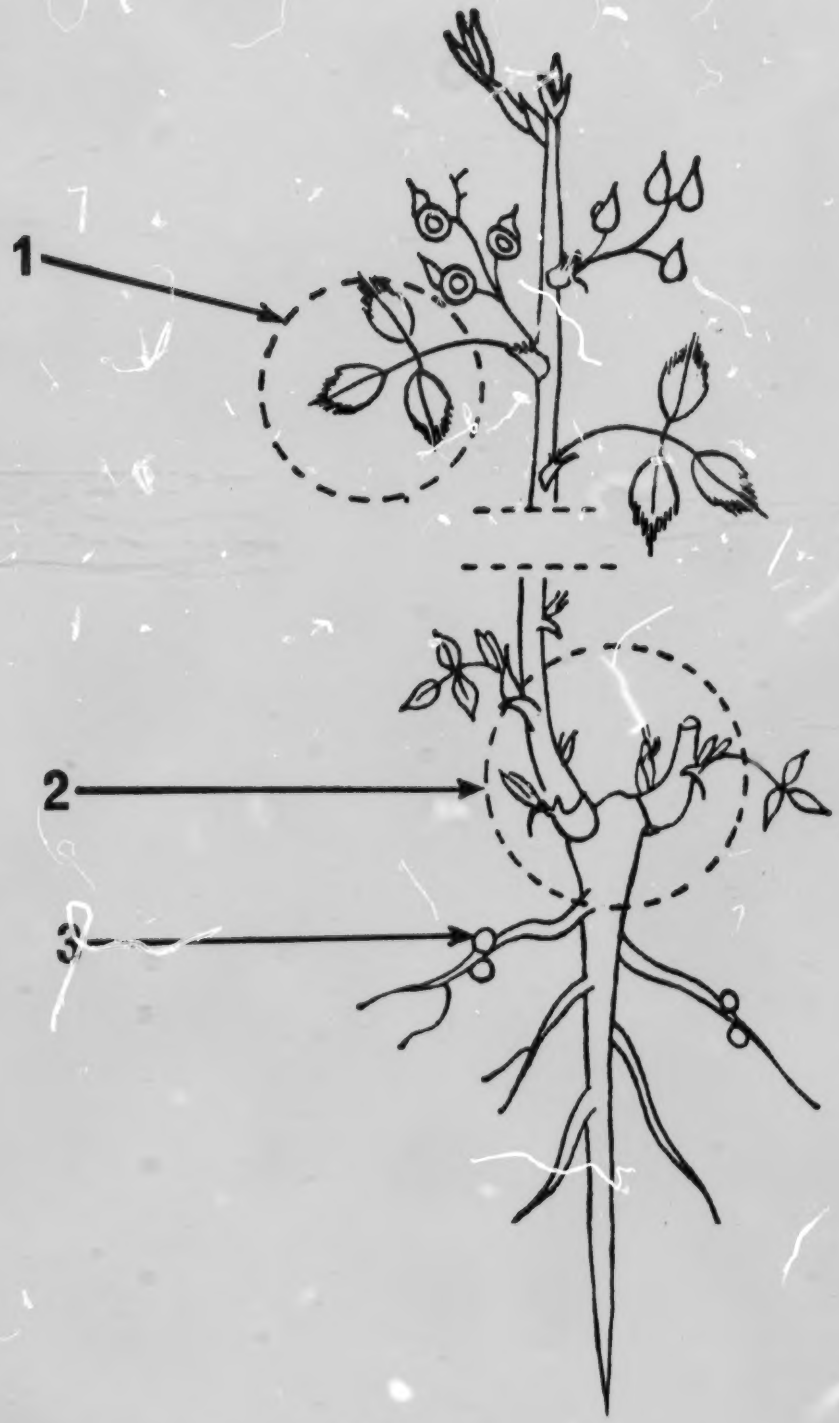
B. P007

The high percentage nodulation induced by treatment 2 is beneficial to a lucerne plant because it

A. encourages nitrification.
B. increases the surface area of the root.
C. enables *Rhizobia* to survive and fix atmospheric nitrogen.
D. stimulates the production of carbohydrate by the plant.

C. P008

The next three questions refer to this diagram of a lucerne plant.



The questions (P009, P010, P011) are on the next page.

These questions refer to the diagram of a lucerne plant on the previous page.

When lucerne is made into hay it is dried carefully to prevent structure 1 from shattering. The reason for this is because

A. the trifoliate leaves contain a large amount of starch.
B. the leaf material is a valuable source of roughage for livestock.
C. the leaves contain relatively more protein than the stem.
D. dried leaves are essential for efficient monogastric digestion.

C P009

To ensure the formation of structure 3 on lucerne plants, farmers

A. sow lucerne at a heavy rate (30 kg per hectare).
B. sow inoculated seed with a heavy application of urea.
C. mix lime-pelleted seed with a culture of *Rhizobium*.
D. dust inoculated seed with a copper fungicide.

C P010

The function of the *Rhizobia* within structure 3 is to

A. cause denitrification, especially in waterlogged soils.
B. convert atmospheric nitrogen into simple nitrogen compounds which can be used by plants.
C. maintain the correct levels of nitrogen in the soil air.
D. carry out the conversion of nitric acid in nitrates.

B P011

The element supplied to soils through legume plants is

A. phosphorus.
B. copper.
C. oxygen.
D. nitrogen.

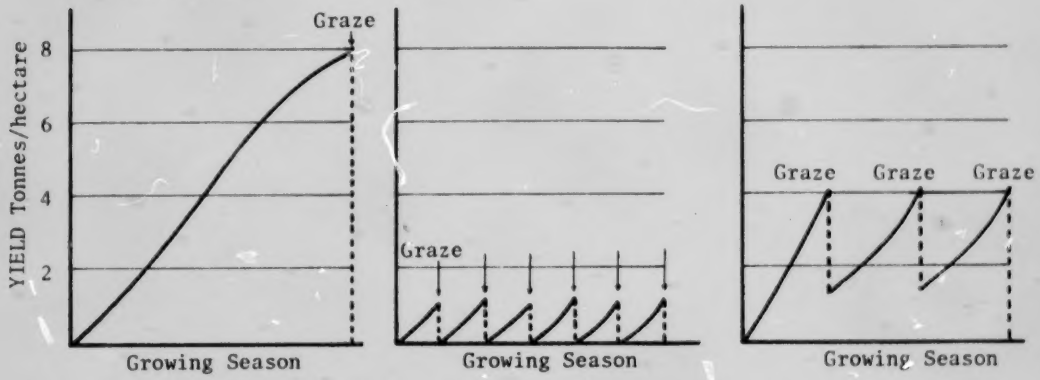
D P012

The group below which contains only legume plants is

A. lucerne, wheat and white clover.
B. lucerne, wheat and sub clover.
C. barley, oats and wheat.
D. lucerne, white clover and sub clover.

D P013

The next question refers to this diagram which shows the effect of regularity of grazing on overall yield of a pasture.



The results of this experiment would indicate that

A. grazing a pasture as often as possible gains the best pasture yield.

B. a pasture gives highest yields when grazed less frequently and a little pasture is left behind after each grazing.

C. letting the pasture mature before grazing gives the biggest yield.

D. pasture should be cut and not grazed to give higher yields.

B P014

Pasture production is usually measured in terms of dry matter content because

A. the water content shows large variations.

B. the water content is of no nutritional value.

C. animals regulate their daily intake according to dry matter content.

D. dry matter content is easier to measure than total wet weight.

A P015

The term "early" as applied to crop varieties means

A. the crop is sown early in the season and matures before mid-season and late varieties.
B. the crop, because of its shortened growing period, can be sown later in the season.
C. it can only be sown in "early" soils.
D. it is a quick maturing variety that can be sown all year round.

B P016

The term perennial, when applied to plants refers to

A. a plant which is capable of regrowth year after year from the same crown.
B. a plant which completes its life cycle in less than 12 months and then dies.
C. a plant which takes more than 12 months but less than 2 years to complete its life cycle.
D. a term used only for deciduous fruit trees.

A P017

Kikuyu grass grows well in coastal areas but it is killed by frosts when grown on the Tablelands. In order to get kikuyu to grow on the Tablelands the best approach would be to

A. grow kikuyu in refrigerated rooms until it gets used to the cold.
B. get pieces of kikuyu from as many places as possible and grow them on the Tablelands - selecting those with any tolerance to frost.
C. try to cross kikuyu with rye grass which is tolerant of frost.
D. wait, possibly thousands of years, until kikuyu slowly adapted to cold conditions and frost.

B P018

For most rapid growth kikuyu requires

A. warm weather with adequate water and nutrients.
B. frequent grazing in winter.
C. cool weather with plenty of water.
D. hot dry weather.

A P019

Nodules are present on the roots of legume plants. The presence of these indicates

A. that all legumes are susceptible to a disease which causes root nodules.
B. that *Rhizobium* bacteria have invaded the plant.
C. that *Rhizobium* bacteria are living as parasites in the plant.
D. the failure of the bacteria to fix nitrogen.

B P020

Lucerne seed is often lime-coated before sowing in order to

A. provide an ideal environment for growth of nitrogen fixing bacteria.
B. neutralize acids in the soil that may be harmful to germinating seeds.
C. satisfy the germinating seed's high requirement for calcium.
D. make the seed heavier and thus easier to sow.

A P021

In N.S.W. the soils used most successfully for lucerne production are the

A. red-brown earth soils of the wheat belt.
B. black soils of the north-west.
C. alluvial soils of river flats.
D. sandstone soils of the coastal regions.

C P022

Lucerne should be cut for hay when

A. all the crop is in flower.
B. the seed pods are fully formed.
C. no flowers are evident.
D. approximately one tenth (10%) of the crop is in flower.

D P023

Conditioning of lucerne following cutting of the crop involves

A. separation of the leaf material from the stems.
B. forming the mown lucerne into rows for drying.
C. crushing the stems to promote even drying.
D. turning the windrows to allow the sun to dry all the material.

C P024

Lucerne survives in low rainfall areas mainly because of its

A. large leaf area.
B. root system.
C. compound leaves.
D. strong stem.

B P025

Photosynthesis

A. enables green plants to obtain nutrients from the soil.
B. produces carbon dioxide as a by-product.
C. provides an immediate source of nutrients for the plants.
D. converts radiant energy into chemical energy in plants.

D P026

The green pigment in leaves is called

A. chloroplast.
B. chlorophyll.
C. chloroform.
D. stomata.

B P027

The most important sites of photosynthesis in green plants are the

A. leaves.
B. woody stems.
C. roots.
D. flowers.

A P028

A *by-product* formed during the process of photosynthesis is

A. sucrose.
B. starch.
C. carbon dioxide.
D. oxygen.

D P029

Every year a lot of money is invested in improving grazing land by fertilising and introducing new plants. These plants are introduced because

A. native plants are unsatisfactory for proper grazing by domestic animals.
B. they are always better than the native plants.
C. native plants cannot be improved.
D. under certain conditions they grow better than native plants.

D P030

In general, sowing for improved pastures is carried out during

A. autumn and winter.
B. winter and spring.
C. spring and summer.
D. autumn and spring.

D P031

Many orchardists plant rows of trees around their orchards. The purpose of these is to

A. provide shade for fruit trees.
B. protect the newly pruned trees from frost damage.
C. control erosion by preventing surface run-off.
D. protect the fruit trees from high winds.

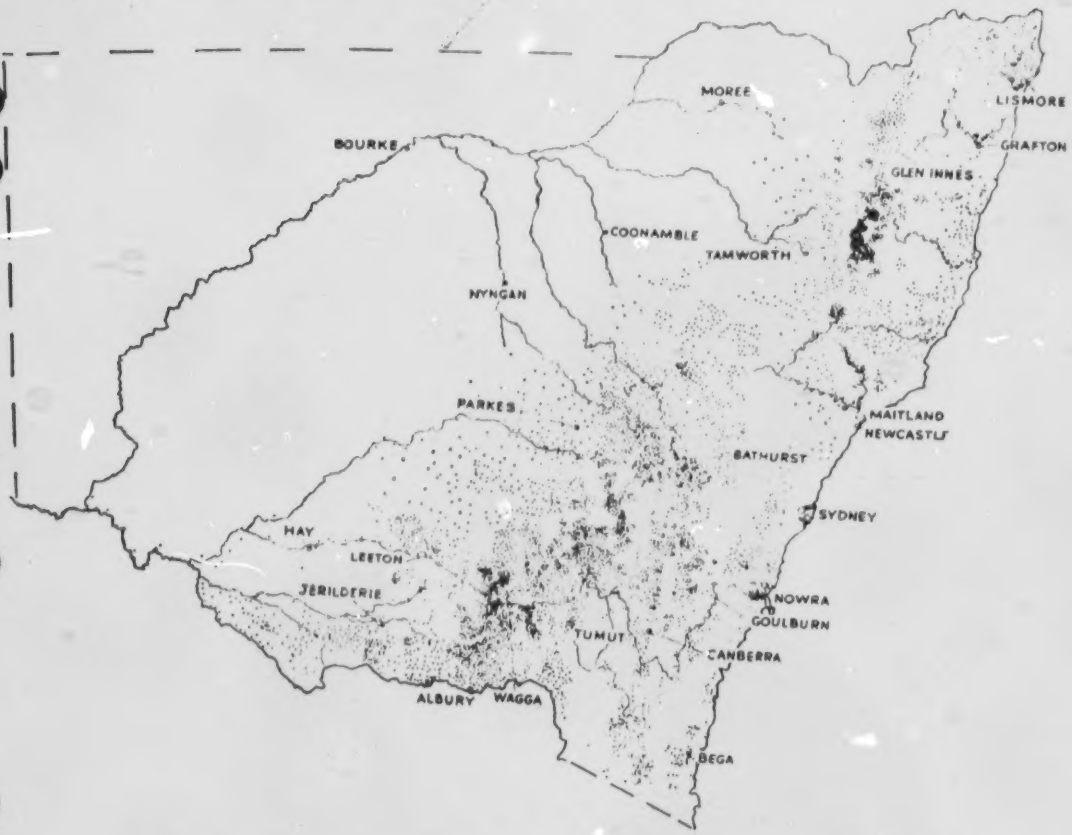
D P032

The removal of excess wood from a fruit tree to give it a desired shape is called

A. "ring" barking.
B. pruning.
C. fruit picking.
D. lopping.

B P033

The next two questions refer to this map showing the distribution of sown pastures throughout N.S.W.



The increased concentration of sown pastures in the southern part of the state is most probably due to the

A. readily available water resources for irrigation.
B. more fertile soils of this area.
C. predominantly winter rainfall which suits subterranean clover.
D. area not being suited to other agricultural activities.

C P034

The low acreage of sown pasture between Sydney and Newcastle is most probably due to

A. proximity to the coast.
B. low rainfall and high temperatures.
C. poor soils and rough terrain.
D. cereal crops being more widely grown here e.g. wheat.

C P035

The next question refers to this passage.

"It is not possible to 'turn off' the herbicides when we have finished with them. Many remain active in the soil for some months after the crop is harvested. This would not be serious if we intended to continue growing the same crop or if the herbicide affected all crops in the same way. The herbicide residue left after one crop may however, severely damage the following crop."

A herbicide is a chemical designed to control

A. the growth rate of crops.
B. unwanted plants and insects in a crop.
C. the height and density of the crop being grown.
D. weeds and other undesirable plants in a crop.

D P036

The next question refers to this table.

Percentage establishment of surface sown seed onto treated and untreated pasture that has been subjected to various stocking rates

	Herbicide treated pasture			No herbicide		
Dry weight of pasture at sowing (kg/ha)	750	1250	3300	750	1250	3300
Stocking Rate	heavily grazed	lightly grazed	ungrazed	heavily grazed	lightly grazed	ungrazed
Ryegrass (% established)	8.0	12.5	23.2	7.3	4.5	14.4

The above results indicate that

A. the herbicide treatment does not have any effect on ryegrass establishment.
B. grazing procedures produce better results than herbicide treatment.
C. the herbicide treatment improves establishment.
D. no conclusion can be made as the results are too variable.

C P037

For successful germination live seeds require

A. light and moisture only.
B. light, heat and moisture only.
C. adequate moisture and oxygen only.
D. oxygen, moisture and sufficient warmth only.

D P038

Among other things, plant seeds all contain a region from which the new plant will develop. The name of this region is the

A. scutellum.
B. endosperm.
C. embryo.
D. pericarp.

C P039

Provided soil moisture is not the limiting factor for seed germination, the depth at which various crop seeds are sown normally depends on the

A. size of the seed.
B. season of the year.
C. conditions of the surface soil.
D. nutrient level of the soil.

A P040

The culture of oats and barley, grown for grain production is

A. different, because one is a winter crop and one a summer crop.
B. similar, because both are grown over summer months.
C. different, because they belong to different families, and only members of the same botanical family have similar methods of culture.
D. similar, because they belong to the same family and are grown in the cool months of the year.

D P041

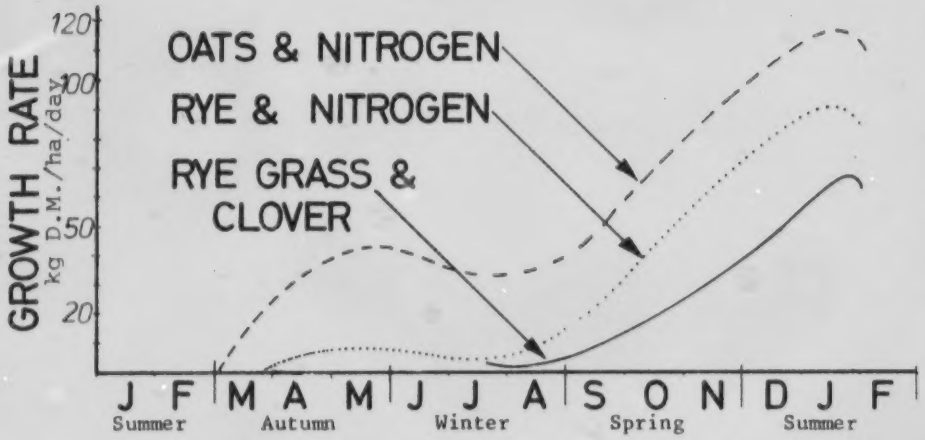
Green plants are important to mankind because

A. they help to maintain a balance between oxygen and carbon dioxide in the atmosphere.
B. they are able to convert light energy from the sun into chemical energy.
C. they form the basis of food chains.
D. they do all of the things listed in (A), (B) and (C).

D P042

The next three questions refer to this graph which shows pasture production at Orange in 1962-3 from

I oats + nitrogen fertilizer
II rye-grass/clover
III rye-grass + nitrogen fertilizer



The primary purpose of sowing oats, with nitrogen fertilizers, early in autumn is to

A. increase pasture production during late autumn and winter.
B. increase carrying capacity over this period.
C. have green feed available for dry ewes throughout this period.
D. utilise the satisfactory moisture generally available during this period.

A P043

The drop in dry matter produced by the oats pasture during the winter would most likely be due to

A. insufficient moisture being available for effective growth.
B. temperatures being too low to maintain effective growth.
C. nitrogen being deficient throughout this period.
D. insufficient light available for effective growth, as there are short days only during the winter period.

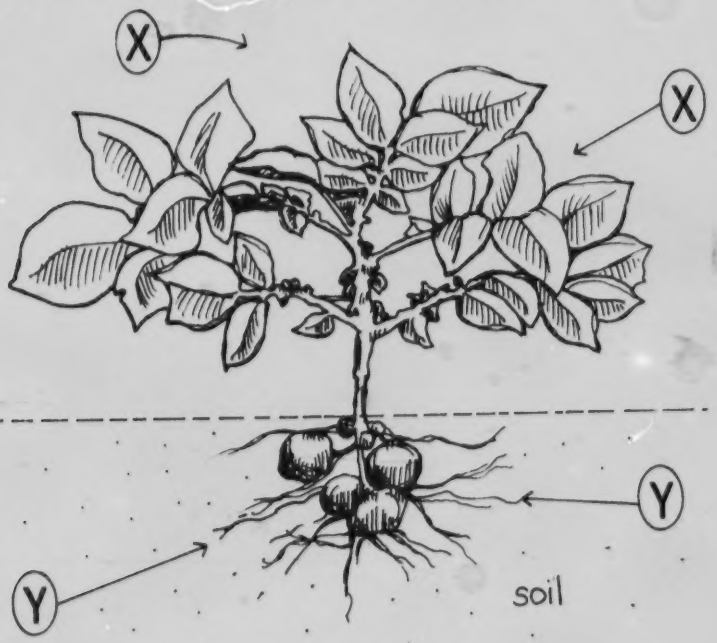
B P044

During late spring when there is an excess of pasture available, farmer would be best advised to

A. increase his annual stocking rate.
B. turn the excess into hay or silage to feed during the winter.
C. burn the excess growth when it has dried off.
D. leave it untouched to prevent soil erosion.

B P045

The next five questions refer to this drawing of a potato plant.



Raw material Y is

A. water.
B. carbon dioxide.
C. oxygen.
D. nitrogen.

A P046

Raw material X is

A. water.
B. carbon dioxide.
C. oxygen.
D. nitrogen.

B P047

The food produced in the leaves as a result of photosynthesis is

A. sugar.
B. fat.
C. protein.
D. chlorophyll.

A P048

The food can be transported to the tubers by means of the

A. epidermis.
B. cambium.
C. xylem.
D. phloem.

D P049

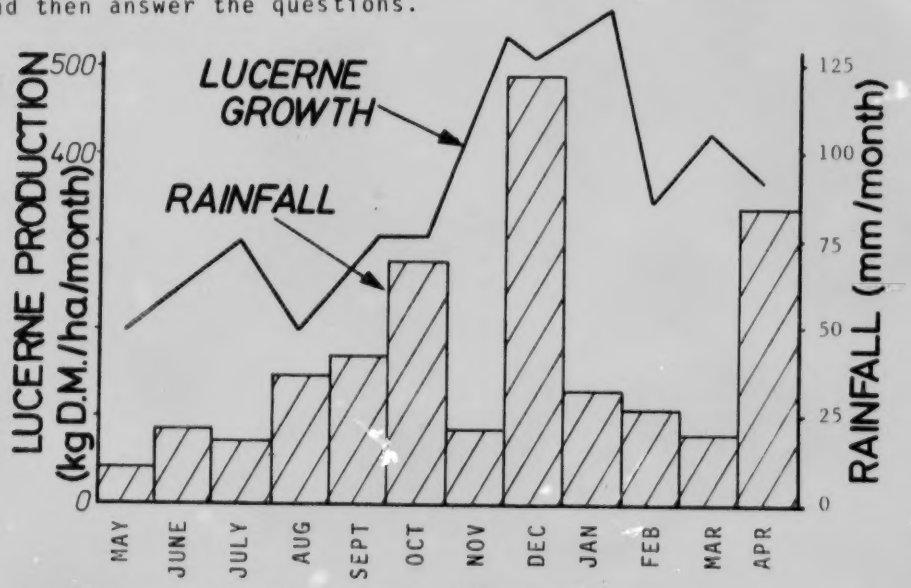
The food is stored mainly in the tuber as

A. sugar.
B. protein.
C. fat.
D. starch.

D P050

See also P001-P006

The next three questions refer to this graph which shows the *rainfall pattern* (in millimetres per month) and the *growth pattern of lucerne* (in kilograms of dry matter per hectare per month) at Trangie Research Station in 1965-66. Study the graph and then answer the questions.



The graph suggests that lucerne at Trangie

A. grows best in the winter if water is available.
B. grows in spring and summer only.
C. shows a fairly uniform growth pattern throughout the year.
D. grows best in the summer.

D P051

If this lucerne crop were irrigated during the winter months then dry matter production per hectare would most likely be

A. comparable with summer production.
B. greater than winter dryland production but less than summer production.
C. limited by soil and air temperatures.
D. (B) and (C) of the above.

D P052

Suppose that no rain fell in the period May 1965 to April 1966. This lucerne would probably

A. survive longer than other legumes or grasses in the area owing to its long tap root system.
B. die quickly owing to the absence of available soil water.
C. show a uniform growth production throughout the period.
D. become permanently stunted in size.

A P053

In crop production, weeds are of economic concern to the farmer because

A. they occupy land that could be used by crop plant.
B. they use water and soil nutrients.
C. they may harbour pests and diseases which affect the growing crop.
D. all of the above.

D P054

A native pasture is deficient in vitamin B_{12}. This will not affect the grazing sheep, however, because

A. sheep do not need this vitamin to grow healthily.
B. it is made by bacteria in the sheep's rumen.
C. it is made in the sheep's skin when this is exposed to sunlight.
D. it is usual to dose grazing sheep with vitamin supplements.

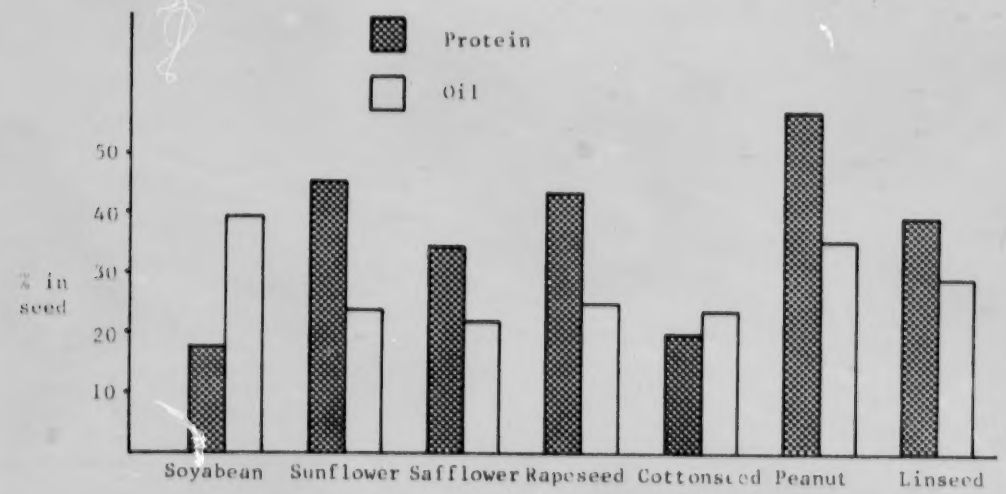
B P055

Which of the following are all winter pasture species in N.S.W.?

A. Barrel medic, subterranean clover.
B. Paspalum, Perennial Rye, *Phalaris tuberosa*.
C. Kikuyu, Green panic, Paspalum.
D. Oats, Perennial Rye, Fescue.

D P056

The next two questions refer to the following graph.



The oilseed with the greatest content of protein is

A. safflower.
B. soyabean.
C. peanut.
D. rapeseed.

C P057

The two oilseed crops shown here which are legumes are

A. soyabeans and peanuts.
B. sunflower and linseed.
C. safflower and rapeseed.
D. safflower and cottonseed.

A P058

Soyabeans are

A. legume plants producing a seed rich in protein and oil.
B. forage legumes used for feed and soil improvement in sugar cane areas.
C. summer growing legumes which produce pods buried underground.
D. a valuable substitute for sub-clover in pastures of northern New South Wales.

A P059

In southern N.S.W. the weed most damaging to wheat production is

A. Turnip weed.
B. Cape weed.
C. Skeleton weed.
D. Mexican poppy.

C P060

The next question refers to the table below.

Time	Lucerne Varieties			
	Hunter River	Can-creep (plants/sq.metre)	Siro-Peruvian	Du Puits
Establishment	22	19	39	11
After 1st Yr.	27	24	25	13
After 2nd Yr.	20	13	14	10
After 3rd Yr.	14	7	7	4
After 4th Yr.	12	7	7	3
After 5th Yr.	12	7	8	3

As indicated by the table, the best variety of lucerne for a 3-year stand would be

A. Hunter River.
B. Can-creep.
C. Siro-Peruvian.
D. Du Puits.

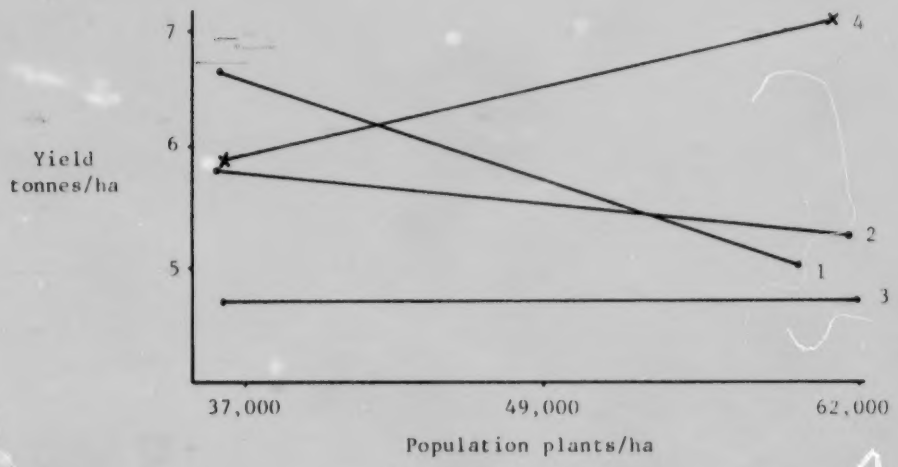
A P061

During a period of high relative humidity following a dry spell, you would expect a plant's evapo-transpiration rate to

A. remain unchanged.
B. become quite high.
C. fall.
D. cease.

C P062

The graph below shows the yields in tonnes/hectare of four varieties of maize (hybrids) over a range of plant populations. 1, 2 and 3 are tall varieties and 4 a short variety.



The graph indicates

A. yields were very variable.
B. the short yield coped better with high plant densities.
C. yields of all varieties changed markedly with changing plant densities.
D. the best average density for tall varieties is about 49 000 plants/hectare.

B P063

Which of the following conditions is not essential for the germination of all seeds?

A. The seed must be viable.
B. There must be a certain amount of oxygen.
C. Some moisture must be present.
D. Light must be available.

D P06

Sod-seeding of vigorous pasture species into the existing pasture has the advantage that

A. the pasture is out of use for a much shorter time than when a seedbed is prepared.
B. the level of production does not change.
C. chemical herbicides can be used.
D. there is a reduction in the initial cost of seed and fertiliser.

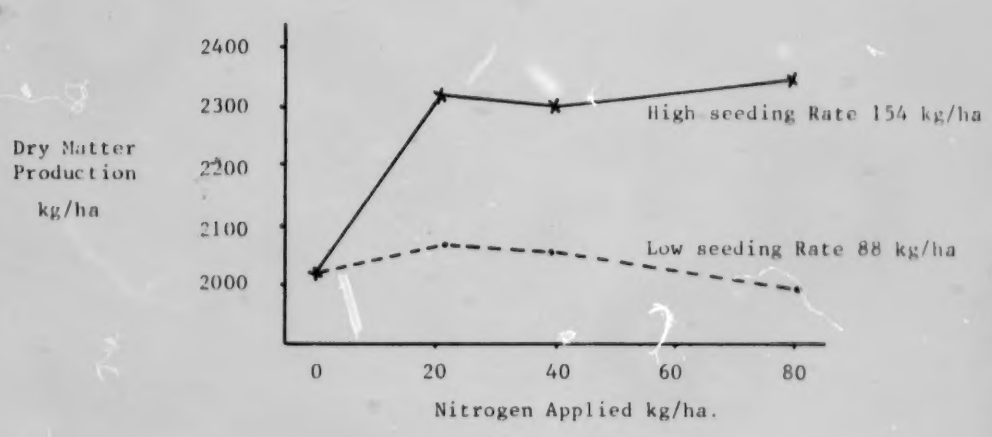
D P06

The plant embryo housed within a seed replaces photosynthesis as a source of energy by

A. growing under the soil to avoid direct sunlight.
B. using water and nutrients from the soil.
C. using protein for growth.
D. using starch and oils in the rest of the seed.

D P066

This graph shows the mean dry matter yield of oats in response to nitrogen fertilizer applied in late winter.



From the results obtained, which combination of factors would be most profitable?

A. Seeding at 88kg/ha and nitrogen applied at 22kg/ha.
B. Seeding at 88kg/ha and nitrogen applied at 88kg/ha.
C. Seeding at 154kg/ha and nitrogen applied at 22kg/ha.
D. Seeding at 154kg/ha and nitrogen applied at 88kg/ha.

C P067

Weeds become troublesome on farms, and this can be due to a great number of factors. The best long term solution to weed problems is to

A. spray all weeds as soon as they appear.
B. attempt to alter the ecological factors which have caused the occurrence of weeds.
C. always use long bare fallows before planting crops or pastures.
D. cultivate growing crops frequently to ensure that no weeds grow.

B P068

Assuming a farmer has a severe weed infestation on his farm, a short term solution to the problem would be to

A. grow only one crop for a long period of time after the soil has been treated with a herbicide.
B. avoid using herbicides at all.
C. grow crops that have a tolerance to all herbicides.
D. apply herbicides that have no or very little residual activity.

D P069

An example of an ecological control measure used to combat a weed is the

A. use of hormone herbicides to suppress the growth of skeleton weed.
B. use of lucerne to compete for water and nutrients against skeleton weed.
C. chipping out of weeds as they become an evident problem in the crop or pasture.
D. deep ripping to expose the underground regenerating parts and spraying with a total herbicide such as Tordon.

B P070

Complete pasture improvement involves

A. laying down a new pasture using new species sown onto a prepared seedbed.
B. careful management of a pasture.
C. removal of weeds from a pasture.
D. adding fertiliser to the pasture.

A P071

A food constituent which is most essential in the formation of new tissues in animals is

A. protein.
B. carbohydrates.
C. lipids.
D. vitamins.

A P072

The process by which light energy is converted into chemical energy is known as

A. respiration.
B. chemosynthesis.
C. photosynthesis.
D. transpiration.

C P073

Plants are unable to utilise light energy unless their cells contain

A. plastids.
B. palisade mesophyll.
C. cellulose.
D. chlorophyll.

D P074

To which of the following would you attribute the greatest increase in weight in a plant?

A. Carbon extracted from CO_2 in the atmosphere.
B. The nitrogen from the air.
C. Minerals from the soil.
D. Minerals added in the water.

A P075

Many plants introduced to Australia by accident have become serious weeds yet in their country of origin they were of little consequence. The best explanation for this is

A. Australia has provided a better climate.
B. the absence in Australia of parasites capable of maintaining control.
C. Australians use a lot of fertilizers and these make weeds grow.
D. the soils in Australia are generally very fertile.

B P076

<u>The metabolism of carbohydrates to provide energy</u> is a basic description of

A. photosynthesis.
B. respiration.
C. protein metabolism.
D. ruminant digestion.

B P077

Read the following description of a crop grown in the State.

"This crop is grown only in the northern parts of coastal N.S.W., requires an evenly distributed rainfall of 1000mm per annum and is usually grown in forest free areas on slopes of hills".

To which of the following crops does this description apply?

A. Maize.
B. Paspalum.
C. Bananas.
D. Sugar Cane.

C P078

The main disadvantage of storing fodder as silage is that

A. special crops have to be grown.
B. the finished product is too dry.
C. it cannot be transported long distances.
D. special costly containers are necessary.

C P079

A seed bed is rolled after sowing a crop to ensure that

A. the soil comes in close contact with the seed.
B. the seed is pressed into the soil.
C. the soil surface will absorb water.
D. weed growth is kept to a minimum.

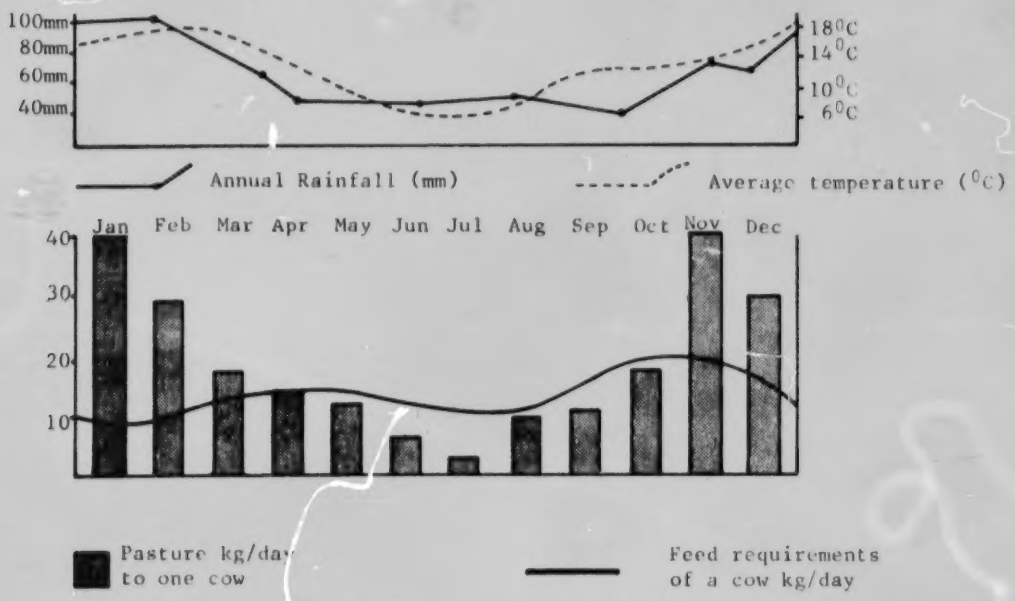
A P080

If crop seed was placed in direct contact with fertilizer at sowing, the most likely result would be

A. increased germination.
B. decreased germination.
C. that the plants would grow quickly and die.
D. rapid growth and establishment of the crop.

B P081

The next three questions refer to the graphs below.



From the information given it is apparent that a feed gap occurs in the

A. months of May to October inclusively.
B. months of March, April and May.
C. months from November through to May.
D. warmest months of the year

A P082

The following two questions refer to the graphs on the previous page.

From the above information, it is most likely that the feed shortage has occurred

A. because inadequate fertilizer was applied in winter.
B. because too much growth in the other seasons allowed for excessive removal of soil, water and nutrients.
C. as a result of the low temperatures and relatively poor rainfall.
D. as a result of constant waterlogging of the soil.

C P083

The feed gap could be practically overcome by

A. conserving the pasture feed in excess periods and feeding it during the gap period.
B. introduction of irrigation.
C. application of greater quantities of selected fertilisers.
D. reducing the average feed requirement of a cow on a daily basis.

A P084

An implement which is driven by the power take-off from a tractor is a

A. diamond harrows.
B. spring tined cultivator.
C. rotary hoe.
D. disc plough.

C P085

The combine not only sows seed and fertiliser but can be used as a

A. disc plough.
B. rigid tined cultivator.
C. spring tined cultivator.
D. chisel plough.

C P086

Soil structure is most likely to be destroyed by operating a

A. mouldboard plough at slow speed.
B. mouldboard plough at high speed.
C. disc plough at slow speed.
D. disc plough at high speed.

D P087

Harrows are implements which

A. depend for their depth of working on their weight.
B. are used for the initial working of the soil.
C. are used for inter-row cultivation.
D. can be used for sowing seed.

A P088

The implement <u>most</u> likely to predispose soil to wind erosion is a

A. mouldboard plough.
B. disc plough.
C. chisel plough.
D. rotary hoe.

D P089

The tractor drawn implement capable of operating at greatest depth is the

A. rotary hoe.
B. harrow.
C. chisel plough.
D. disc plough.

C P090

A wheat farmer has ploughed and cultivated a paddock in readiness for a wheat crop. Heavy rain has caused a crust to develop on the worked ground. Which of the following implements would be used to break the crust?

A. Rotary hoe.
B. Scarifier.
C. Mouldboard plough.
D. Diamond harrows.

D P091

The particular value of a mouldboard plough is that it

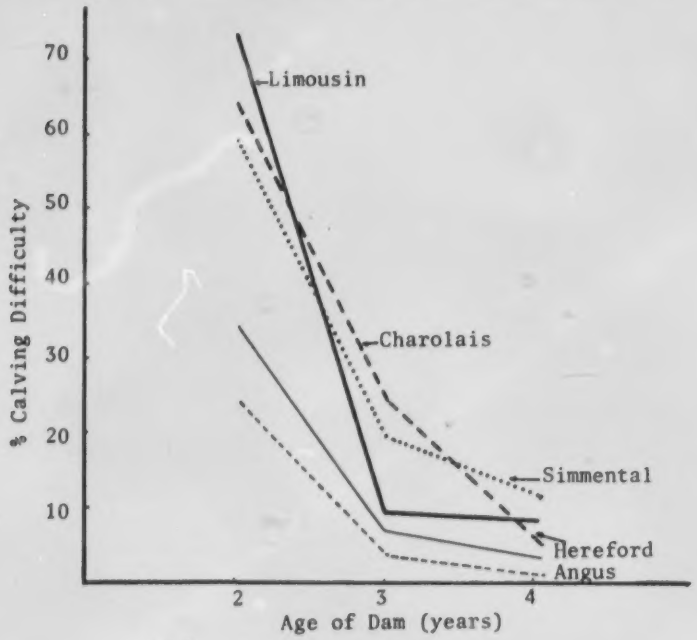
A. is mostly suited to sandy soils.
B. finds most use in western wheat growing areas.
C. is also capable of being used for the very deep ripping of soils.
D. completely inverts the furrow slice.

D P092

ANIMALS

This question refers to the graph shown below.

Relationship between calving difficulty, sire breed and dam age



This graph indicates that

A. most cows have little difficulty calving when they are young.

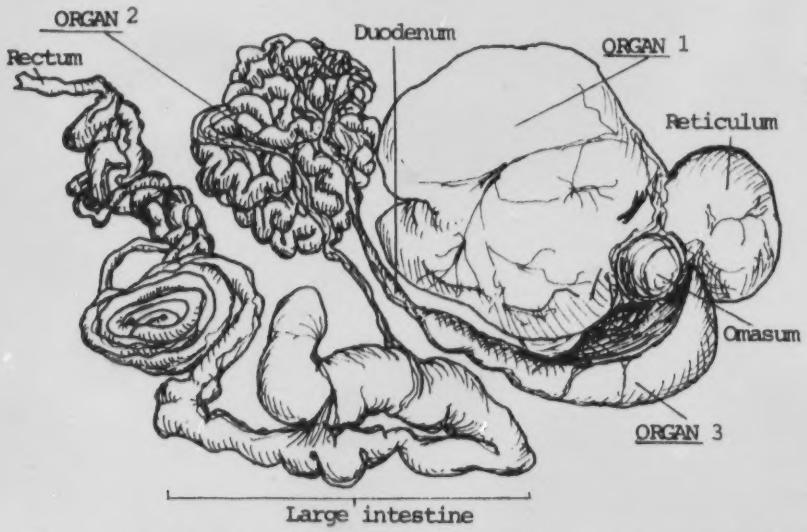
B. calving difficulty decreases with increasing age of the cow.

C. breed of the sire has no effect on calving difficulty of the cow.

D. calving difficulty is related directly to the breed of the sire and age of the cow is totally unrelated.

B A001

The diagram of the digestive system of the sheep is referred to in the next four questions.



The ruminant type of digestive system, as compared with the monogastric type, has the chief advantage of being able to

A. store large quantities of food.
B. synthesize vitamin A.
C. survive for long periods without water.
D. digest cellulose efficiently.

D A002

The function of the organ labelled 2 is to

A. convey foodstuffs to organ 3.
B. convey foodstuffs to and from organ 3.
C. regulate the amount of water in the foodstuff.
D. secrete digestive juices and absorb products resulting from digestion.

D A003

The name of the organ labelled 3 is the

A. pancreas.
B. abomasum.
C. oesophagus.
D. ilium.

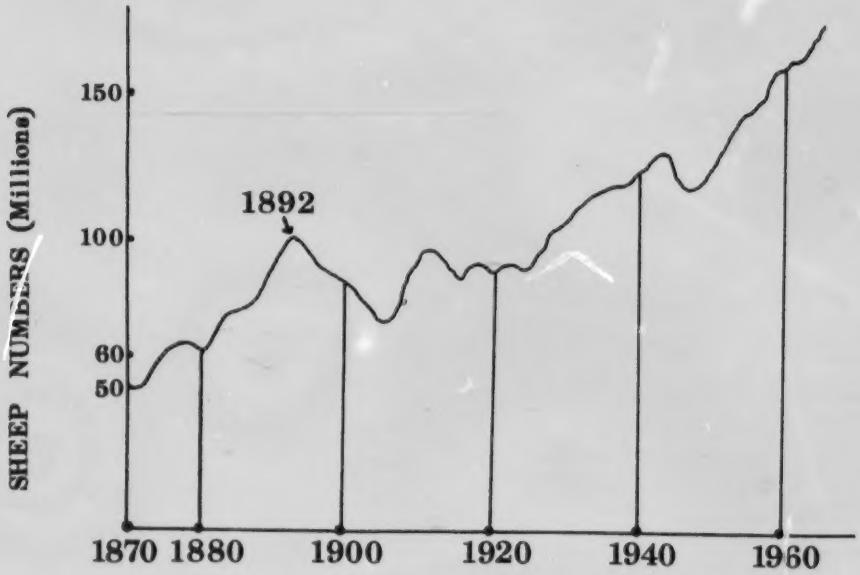
B A004

The main function of the organ labelled 1 is to

A. absorb water into the body.
B. contain micro-organisms which assist in food breakdown.
C. digest milk in young animals.
D. store food before it is digested.

B A005

The next three questions refer to the graph of sheep numbers in Australia.



The increase in numbers between 1870 and 1892 was largely due to

A. the improvement of pastures.
B. the development of new breeds such as the Corriedale and Polwarth.
C. the use of land previously unexploited.
D. an increase in the demand for wool on the home market.

C A006

The sharp decline in sheep numbers between 1892 and 1902 was brought about by

A. floods.
B. diseases.
C. the sheep tick or ked
D. extreme drought.

D A007

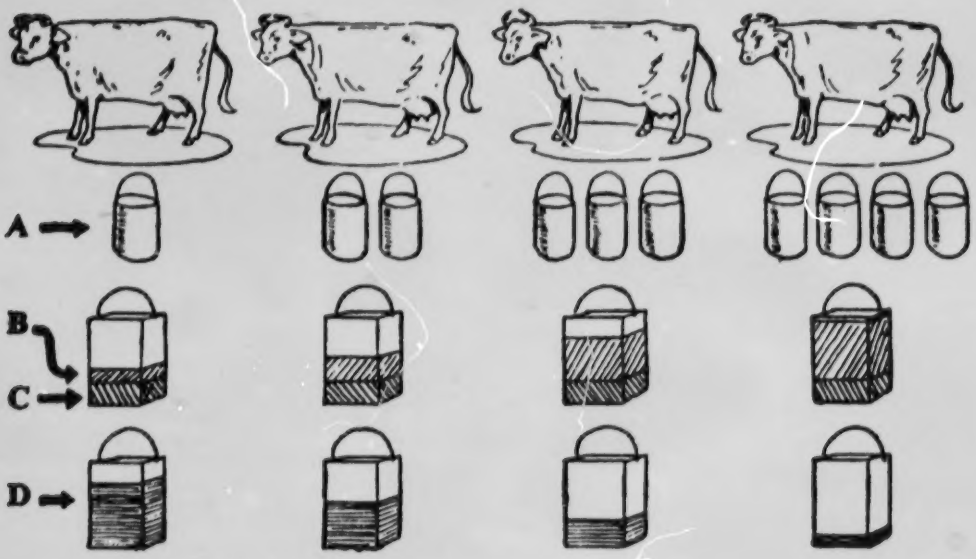
The increase in sheep numbers between 1945 and 1960 was mainly the result of

A. development of better breeds.
B. pasture improvement.
C. better shearing methods.
D. higher lambing percentages.

B A008

The next two questions refer to the diagram below.

Effect of level of production on efficiency of cows in converting feed to milk



A—Gallons of milk per day
B—Daily feed needed for milk production
C—Daily feed needed for maintenance
D—Feed used to produce each gallon of milk

The diagram illustrates that compared to low producers, high producing cows

A. are more efficient producers of milk.
B. require more feed for maintenance.
C. give less milk per unit of food eaten.
D. give more milk simply because they are fed more.

A A009

Which of the following alternatives should the farmer adopt for maximising efficiency when supplementary feeding?

A. Increase the amount of feed given to the low producing cows.
B. Decrease the amount of food given to the high producing cows.
C. Feed all cows in proportion to their ability to produce milk.
D. Give all cows access to the same amount of food.

C A010

"Supplementary feeding" of dairy cows involves

A. the sole use of concentrates as feed for the cows.
B. using electric fences to control the areas that the cows can graze.
C. feeding concentrates or fodder crops in addition to pasture.
D. allowing the cows to graze pasture after the afternoon milking as well as after the morning milking.

C A011

A farmer would find that supplementary feeding of dairy cows may be necessary when

A. the demand for milk has increased.
B. pasture quality is low and milk production is falling.
C. there is a danger that the cows may be eating too much pasture and becoming overfat.
D. the incidence of mastitis is high.

B A012

Cattle have a low efficiency of food conversion. This statement means that cattle

A. need to eat a large amount of food to produce a relatively small amount of product.
B. generally eat poor quality feed and cannot produce high quality products.
C. cannot digest protein efficiently.
D. are able to convert food into product with very little waste.

A A013

Brahman and Zebu cattle contribute most to the cattle industry

A. as sires on coastal dairy farms.
B. in the grading-up of dairy herds to produce dual purpose cows.
C. in the beef cattle regions of southern N.S.W.
D. in tropical and sub-tropical cattle producing areas.

D A014

The term <u>colostrum</u> refers to

A. milk which has had all the cream removed.
B. a substance used widely in dairies to clean milking machines.
C. a disease in the colon or large intestine.
D. first 'milk' produced immediately following birth of offspring.

D A015

The following operations are all performed as part of normal sheep husbandry.

A. Dipping
B. Drenching
C. Marking
D. Vaccinating

For the next three questions choose the operation (A to D) which has the function given.

Controls external parasites such as itch mites, lice and sheep keds.

A A016

Controls internal parasites that infest the digestive system.

B A017

Reduces the incidence of diseases such as pulpy kidney.

D A018

For the next two questions, match the terms listed A to D with the definitions.

A. Hogget
B. Wether
C. Stag
D. Comeback

A mature ram castrated or improperly castrated.

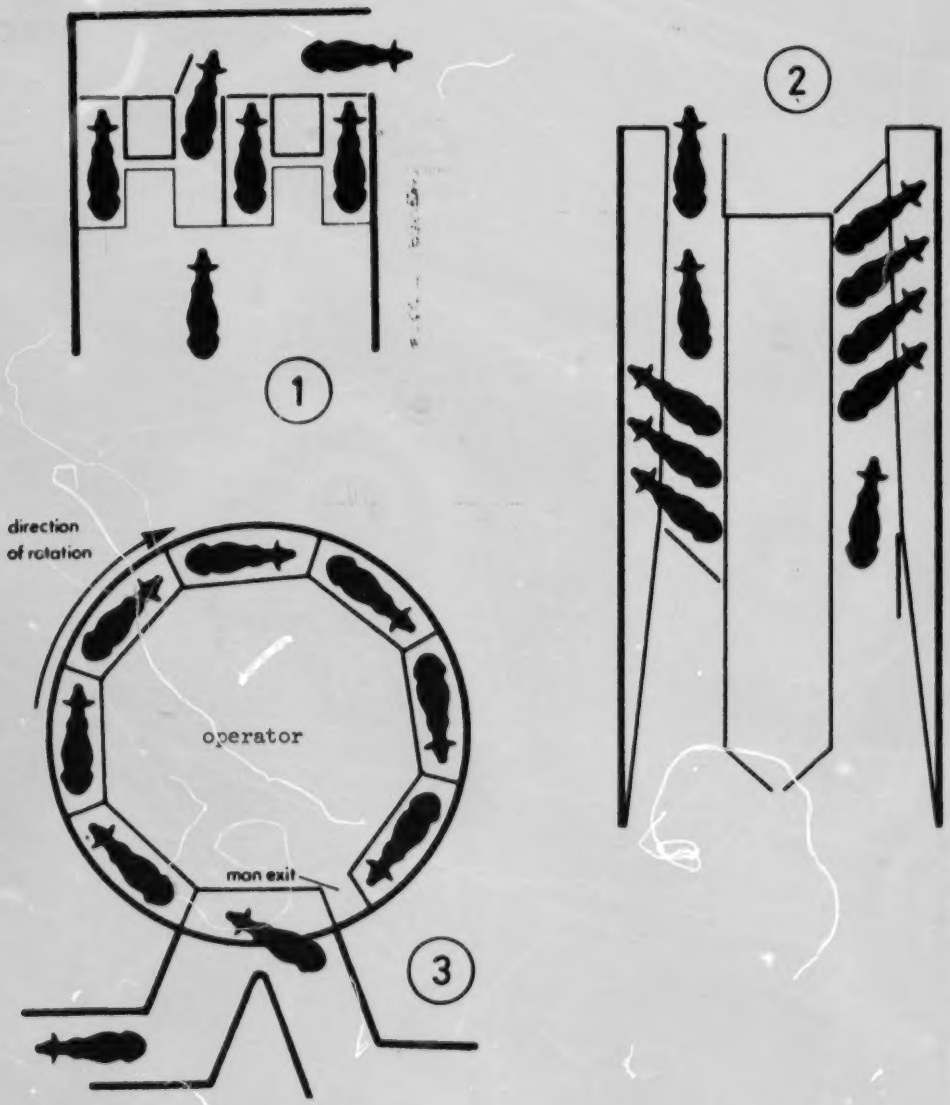
C A019

The progeny of a crossbred ewe and a Merino ram.

D A020

The next four questions refer to the diagram of milking shed designs.

Design principles of milking areas of some dairies



The design labelled Type 2 is known as a

A. Walk-through Design.
B. Turnstyle Design.
C. Herringbone Design.
D. Carousel Design.

C A021

Three more questions appear on the next page

The questions on this page refer to the diagram on the previous page.

The main advantage of having a shed of the Type 3 design is that

A. the dairy does not occupy much floor space.
B. it is cheap to install.
C. access for the cows is good.
D. the operator can observe all cows with a minimum of movement.

D A022

The main disadvantage of design labelled Type 2 is that

A. there is a risk of working area becoming excessively fouled with dung and urine.
B. the speed at which each batch is milked depends on the slowest milking cow in the batch.
C. it takes a long time to train cows to stand in this formation.
D. access to the cows' udders is poor.

B A023

In Type 2 which of the following statements concerning the position of the operator is correct?

P. The cows and the operator should be at the same level.
Q. The cows should be on an elevated platform and the operator should be at ground level.
R. The operator should be below ground level (in a pit) and the cows should be at ground level.
S. Operator fatigue is reduced if he/she is working at ground level.

A. P only.
B. Q only.
C. Both Q and R.
D. Both Q and S.

C A024

On calling at several poultry farms to buy fresh eggs I saw a notice at every place I visited.

Please don't sound horn.

Poultry farmers have such notices because

A. the sound frightens the birds and they do not lay eggs for one or two days.
B. the sound frightens the birds and they drop and break their eggs.
C. the sound frightens the birds, their feathers drop out and they go into the moulting stage.
D. the sound of a car horn has a high frequency and causes the eggs to vibrate and go bad.

A A025

In feeding broiler chicks, the optimum percentage of protein in the feed is

A. within the range 40-45%.
B. approximately 20%.
C. within the range 10-12%.
D. not an important consideration.

B A026

Pigs sold as baconers are aged approximately

A. 1 month.
B. 3 months.
C. 6 months.
D. 18 months.

C A027

High production rate, rapid growth and high efficiency of food conversion are production characteristics of

A. sheep and cattle.
B. horses.
C. sheep only.
D. pigs and poultry.

D A028

"A small-framed Merino with very fine wool." This description would apply best to the type of Merino found on the

A. Western plains.
B. Western slopes.
C. Tablelands.
D. Coast.

C A029

The area of N.S.W. where most large framed, strong wool Merino sheep are typically found is the

A. Tablelands.
B. Western slopes.
C. Western plains.
D. Coastal region.

C A030

The description : "It is the earliest maturing of all sheep breeds, and both the male and female have well developed horns" best fits the

A. Merino.
B. Southdown.
C. Romney Marsh.
D. Dorset Horn.

D A031

Many farmers and graziers accuse foxes and eagles of causing a great deal of loss of young lambs. Which of the following observations would provide real evidence to contradict this view?

A. Farmers have seen foxes and eagles carrying off young lambs.
B. Foxes and eagles have been seen eating dead lambs.
C. Examination of stomach contents of foxes and eagles killed on grazing properties has shown that lamb is rarely part of their diets.
D. Conservationists say that foxes and eagles are part of the natural balance of life and they do not eat lambs because they are not part of the natural environment.

C A032

Dipping sheep by immersing them in or spraying them with chemicals is a routine operation on a sheep farm. Farmers carry out this operation

A. because the chemicals can help increase wool growth.
B. so that any cuts or wounds incurred during shearing will not become infected.
C. to make sure the wool remains relatively clean.
D. to destroy external parasites such as lice and itch mites.

D A033

Mastitis is a condition

A. affecting the blood in all animals.
B. found most commonly in males.
C. causing inflammation of milk secreting organs.
D. commonly associated with poor feed.

C A034

A common disease in poultry is

A. tetanus.
B. swine fever.
C. coccidiosis.
D. pulpy kidney.

C A035

Poultry raising is called an intensive industry because

A. poultry are allowed free range.
B. grain is the main source of feed.
C. many birds are housed in a small area.
D. it is a very profitable industry.

C A036

The system of housing laying hens in which up to three birds are placed in a small cage is known as the

A. Deep Litter system.
B. Battery system.
C. Free range system.
D. Breeding team system.

B A037

In the animal body, the main saccharide (sugar) that circulates in the blood is

A. maltose.
B. sucrose.
C. glucose.
D. lactose.

C A038

The purpose of digestion in farm animals is to

A. use up some of the energy of the animal which would otherwise be wasted.
B. remove from the food eaten those substances that could be poisonous or harmful.
C. prepare food which is ingested for ultimate absorption into the bloodstream.
D. change simple substances in the diet to more complex ones which can be used directly to build body tissues.

C A039

Milking machines must be carefully cleaned to avoid

A. cows contracting venereal diseases like vibriosis.
B. farmers being fined by the Dairy Industry Authority.
C. milk spoiling organisms building up in the milk lines.
D. cows like the Jersey being overmilked.

C A040

The description : "It is either red or white or a mixture of the two colours and it is noted for its quick maturity" best fits

A. Shorthorn.
B. Hereford.
C. Aberdeen Angus.
D. Devon.

A A041

"The final decision between sheep and cattle must depend on the land-holder's circumstances. If the decision is not made on personal preference it will depend on the relative availability of land, capital and labour."

Which of the following factors would NOT affect the decision mentioned above?

A. A knowledge of present trends in prices for both sheep and cattle.
B. The availability of labour.
C. The returns (per hectare) gained from selling the sheep or cattle products.
D. The efficiency with which sheep and cattle convert plants into animal products.

D A042

Cattle and sheep farmers sometimes have a clump of trees in their paddocks to

A. conserve natural species for wild animals to live on.
B. provide shelter from climatic extremes.
C. make a profit from selling fire wood when the trees grow tall enough.
D. provide essential minerals and vitamins for the sheep and cattle.

B A043

Castration is an operation normally performed on young male farm animals to

A. prevent such animals from breeding.
B. enable them to be handled more easily.
C. control their rate of growth and so achieve uniformity.
D. meet all the requirements indicated in A, B and C above.

D A044

The fertilization of the ovum by the sperm takes place in the

A. Fallopian tubes.
B. ovary.
C. uterus.
D. vagina.

A A045

In farm animals, the embryo develops from fusion of the ovum with the

A. male reproduction organ.
B. spermatozoon (sperm).
C. testicles (testes).
D. semen.

B A046

The percentage of protein in a diet may vary from 5% to 20%. Animals requiring the highest percentage of protein are

A. old and in poor condition.
B. young and growing fast.
C. very big and fat.
D. males and females in the breeding season.

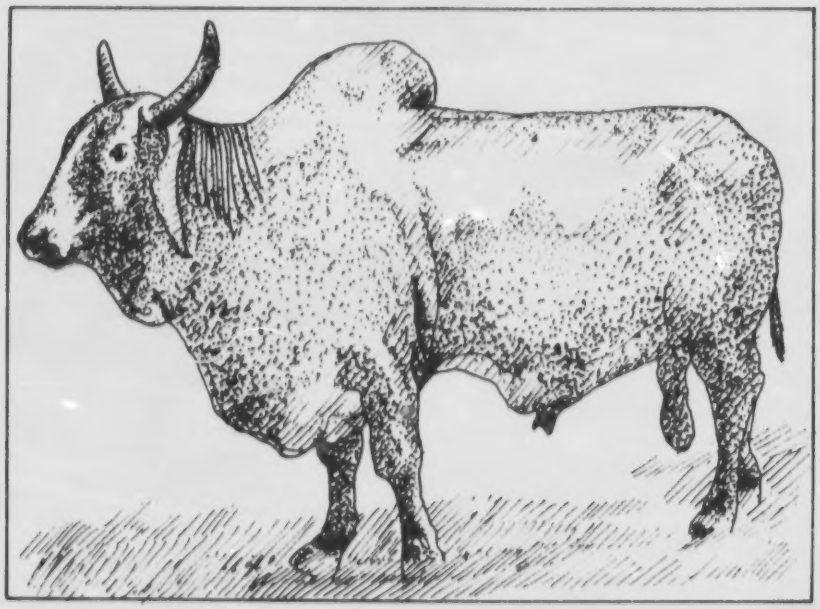
B A047

A common domestic animal that consumes large quantities of bulky herbage but is not a ruminant is the

A. pig.
B. horse.
C. goat.
D. fowl.

B A048

The next three questions refer to this drawing.



The breed illustrated above probably originated in

A. Australia.
B. Holland.
C. India or Asia.
D. North or South America.

C

A049

Such breeds are being used in Australia in increasing numbers for the purpose of

A. increasing the milk production in dairy herds.
B. reducing the risk of outbreaks of foot and mouth disease.
C. improving beef yields in some particular climatic areas.
D. eventually replacing existing beef breeds such as Hereford and Angus.

C

A050

The features possessed by breeds of the type illustrated which are of economic importance to breeders are

A. a greater ability to resist heat.
B. greater resistance to external parasites, e.g. cattle tick.
C. the ability to convert feed more efficiently than breeds of British origin.
D. all of the above, (A), (B) and (C).

D

A051

"Sheep for both the production of prime lambs and wool combined with wheat growing" best describes the agricultural production in the

A. Coastal Zone.
B. Tablelands.
C. Western Slopes.
D. Western Plains.

C

A052

Matings involving animals which are closely related (such as sire to daughter, dam to son, brother to sister) are known as

A. inbreeding.
B. line breeding.
C. progeny testing.
D. selection.

A

A053

The practice used by stock owners of retaining the type of animal he wants and culling those which do not measure up to his standards is called

A. back crossing.
B. inbreeding.
C. line breeding.
D. selection.

D

A054

The practice of mating a sire with a number of females, then mating the same sire with the female progeny and finally comparing the performance of the daughters with those of dams is called

A. back crossing.
B. line breeding.
C. progeny testing.
D. selection.

A

A055

Ruminant animals show to advantage over monogastric animals in that they

A. can store a larger amount of food.
B. can make more efficient use of cellulose.
C. make more efficient use of first class proteins.
D. go without water for longer periods.

B

A056

Monogastric animals show to advantage over ruminant animals in that they

A. eat a wider variety of food types.
B. produce higher value products.
C. have fewer disease problems.
D. generally show greater feed conversion efficiency.

D

A057

Progesterone

A. is produced by the corpus luteum.
B. is produced by the ovum.
C. causes the pelvis to relax at the end of pregnancy.
D. initiates oestrus and ovulation.

A

A058

Most of the chemical breakdown of food during digestion in the pig occurs in the

A. stomach.
B. small intestine.
C. caecum.
D. large intestine

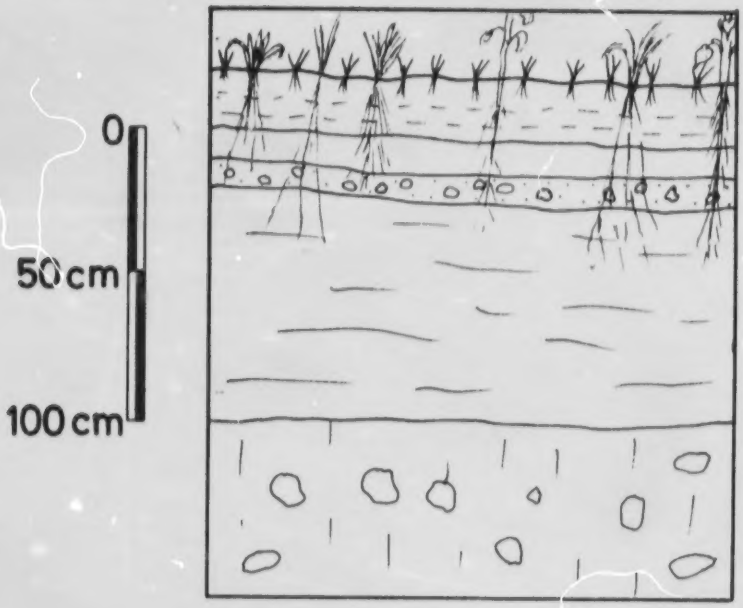
B

A059

Further animal questions appear on pages 90 - 97.

SOIL

The next three questions refer to this soil profile and description.



pH	Depth	Soil Type	Per cent clay
5.3	0-20cm	Grey silty loam	21
5.2	20-30cm	Light grey loam, structureless	30
5.4	30-40cm	Becoming finer in texture with large concretions of ironstone	55
5.3	40-50cm	Yellow-grey clay with few roots showing	65
	50-120cm	Yellow-grey clay with red and grey mottling	

The above profile would most likely occur in

A. a high rainfall area.
B. a relatively low rainfall area.
C. deserts.
D. river flood plains.

A S001

Which one of the following properties would enable you to identify the profile shown above?

A. The soil is "self-mulching".
B. There is a sudden change of texture down the profile.
C. The soil pH remained quite constant.
D. Lime was absent throughout the profile.

S002

B

Consider the effect of erosion on the profile above due to overcropping in short rotations and overstocking in low rainfall years. The most serious consequence of this erosion would be the

A. tunnelling of the topsoil.
B. removal of the topsoil by wind exposing the ironstone.
C. sheet and gulley erosion of the coarse textured subsoil.
D. sheet erosion of the fine textured topsoil and the gulley erosion of the coarse textured subsoil.

S003

D

The micro-organisms which you would expect to find in greatest numbers in the soil belong to the group known as

A. fungi.
B. bacteria.
C. protozoa.
D. algae.

B

S004

An element found in soils which is needed by animals but not by plants is

A. nitrogen.
B. potassium.
C. calcium.
D. cobalt.

D

S005

Soil erosion is most likely to be caused by

A. high rainfall.
B. removal of plant cover.
C. continuous cropping.
D. "lea" farming.

B

S006

A soil formed under high rainfall conditions usually has

A. a low concentration of soluble salts.
B. a high concentration of soluble salts.
C. all the soluble salts removed.
D. none of the soluble salts removed.

A

S007

The presence of distinct zones or horizons in a soil usually indicates

A. a mature soil.
B. an immature soil.
C. a soil formed under hot dry conditions.
D. that the soil has been dominated by one soil-forming factor.

A

S008

The nutrient level of the soil is

A. important for seed germination.
B. not important for seed germination but must be adequate for normal growth after the first leaves have appeared above ground level.
C. important for radicle emergence from the seed.
D. important for seed emergence through the soil surface.

B

S009

The next two questions refer to these fertilizers:

F1 sulphate of ammonia

F2 superphosphate

F3 gypsum

F4 potassium chloride (muriate of potash)

Three of the above fertilizers would add sulphur to the soil. They are

A. F1, F2 and F3.
B. F2, F3 and F4.
C. F1, F3 and F4.
D. F1, F2 and F4.

A S010

Mixed fertilizers (called N.P.K. fertilizers) usually consist of mixtures of

A. F1, F2 and F3.
B. F2, F3 and F4.
C. F1, F2 and F4.
D. F1, F2, F3 and F4.

C S011

Which of the following best describes the soils occurring in the Coastal Zone of N.S.W.?

A. Fairly heavy textured soils, those in the south being Red Brown Earths.
B. Variable in the east but in the west mainly Desert Loams.
C. Mainly relatively infertile podsolic soils with some fertile alluviums in the river basins.
D. Mainly podsolic with a small area of limestone soils around Mudgee.

C S012

On drying, soils with a high percentage of clay are likely to

A. shrink and crack.
B. remain the same.
C. become loose and cloddy.
D. become powdery.

A S013

A soil is said to be at field capacity when

A. no more water can enter.
B. the soil appears to be dry a few inches below the surface.
C. plants growing in this soil commence to wilt.
D. it retains water against the action of gravity 48 hours after irrigation.

D S014

Soil air usually contains

A. more carbon dioxide than atmospheric air.
B. less carbon dioxide than atmospheric air.
C. the same amount of carbon dioxide as atmospheric air.
D. no carbon dioxide.

A S015

If a farmer sod-seeded an improved pasture species into native pasture, he would be aiming at

A. reducing the danger of soil erosion.
B. overcoming a phosphorus deficiency in the soil.
C. increasing the carrying capacity of the pasture.
D. providing variety in the sheep's diet.

C S016

If legumes were sod-seeded into native pasture, then this would

A. overcome all possible shortages of greenfeed for the sheep.
B. increase the available nitrogen level in the soil.
C. raise the protein level of the sheep's diet.
D. (B) and (C)

D S017

A native pasture is growing on a nitrogen-poor soil - hence it is also low in nitrogen. This will cause the grazing sheep to

A. have rickets.
B. have a poorly formed bone structure.
C. lay on muscle slowly.
D. (A) and (B).

C S018

If the farmer were anxious to overcome the nitrogen deficiency in a soil as quickly as possible, he would be best advised to

A. topdress the native pasture with superphosphate.
B. sod-seed legumes into the pasture.
C. heavily graze the native pasture then spread the animal manure evenly over the area.
D. apply urea or sulphate of ammonia to the area.

S019

D

Which of the following are all organic constituents of the soil?

A. Clay, sand and silt.
B. Plant and animal remains, humus and organisms.
C. Sand, plant and animal remains and humus.
D. Clay, sand silt, humus and organisms.

B S020

Graded banks are used in erosion control

A. only in permanent pastures on hilly country.
B. to conduct run-off water from an area at a safe velocity.
C. as a means of storing water.
D. where cultivation up and down a slope is unavoidable.

B S021

A knowledge of soil structure is important to a farmer because it could influence

A. his management practices for that soil.
B. when he should plant his crops.
C. the stocking rate for that paddock.
D. the seeding rate if he is sowing a crop.

A S022

Excess acidity in soils (low pH) restricts plant growth for several reasons. Which of the following practices most effectively reduces acidity of soils (or raise the pH value)?

A. Adding sulphate of ammonia to the soil.
B. Using superphosphate fertiliser.
C. Spreading lime on the soil.
D. Irrigation.

C S023

Optimum soil moisture conditions are best obtained by keeping the soil

A. permanently saturated.
B. above field capacity all of the time.
C. moisture level between wilting point and field capacity.
D. just above field capacity.

C S024

The term soil structure refers to the

A. arrangement of soil particles.
B. content of clay in the soil.
C. water holding capacity of a soil.
D. ease with which a soil can be cultivated.

A S025

If a farmer wished to improve soil structure he would most likely

A. add organic matter.
B. deep plough.
C. bare fallow.
D. irrigate.

A S026

OR

When a farmer improves the structure of a clay soil he most probably

A. cultivates more frequently.
B. increases the proportion of clay.
C. incorporates organic matter.
D. adds large amounts of sulphate of ammonia.

C S027

Clay is an important constituent of soils because

A. the clay particles hold water and minerals in the soil.
B. it allows roots to penetrate the soil easily.
C. it ensures that the soil does not become waterlogged.
D. plants actually absorb clay into the root hairs.

A S028

Organic material is important in soils because

A. plants cannot absorb minerals from the soil if it is not present.
B. it improves soil structure and adds nutrients to the soil.
C. artificial fertilizers cannot provide all the nutrients required for plant growth.
D. only organic matter can provide all nutrients essential for plant growth.

B S029

The size of pore spaces in a soil has a direct effect on the soil's

A. water holding capacity and aeration.
B. aeration and colour.
C. water holding capacity only.
D. temperature.

A S030

If cultivated when wet, soils of fine texture tend to

A. form large aggregates or clods.
B. form very small aggregates.
C. develop an improved structure.
D. produce much better crops.

A S031

The breakdown of organic matter to form nitrogen compounds in the soil is termed

A. nitrogen fixation.
B. denitrification.
C. nitrification.
D. symbiotic nitrogen fixation.

C S032

Rhizobium is an example of

A. free-living nitrogen-fixing bacteria.
B. free-living nitrogen-fixing fungi.
C. symbiotic fungi.
D. symbiotic bacteria.

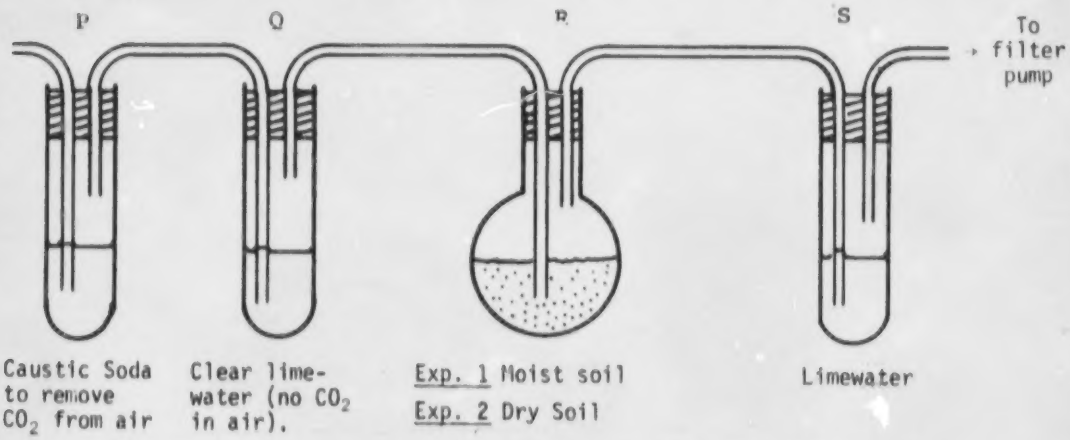
D S033

The fraction of the soil best described as the active fraction is

A. coarse sand.
B. fine sand.
C. silt.
D. clay.

D S034

The next two questions refer to the diagram below.



Two sets of apparatus were set up as indicated above. In Experiment 1 R contained moist soil while in Experiment 2 R contained dry soil.

In Experiment 1 you might reasonably expect the limewater in S to

A. turn milky due to O_2 production.
B. turn milky due to CO_2 production.
C. remain clear.
D. immediately show a white precipitate of calcium sulphate.

B S035

If in Experiment 1 limewater in S turned milky and in Experiment 2 limewater in S remained clear, you might reasonably conclude that

A. micro-organisms prefer dry soil to moist soil.
B. micro-organisms prefer moist conditions.
C. dry soil contains CO_2.
D. water reacts with soil to produce CO_2.

B S036

Which of the following is an organic constituent found in the soil?

A. Plant remains.
B. Carbon dioxide.
C. Sand.
D. Water.

A S037

The next question refers to the passage below.

"Looking at the problem broadly, Australian soils are not remarkable for their fertility. Those in the districts of most satisfactory rainfall have generally been leached, the areas of river alluviums and soils from some igneous rocks being exceptions. The best soils, on the other hand, are found all too often in districts of inadequate or erratic rainfall."

Referring the above statement to Southern Australia the nutrients most likely to be lacking are

A. Nitrogen and Potassium.
B. Nitrogen and Phosphorus.
C. Phosphorus and Potassium.
D. Phosphorus and Calcium.

B S038

Fertilizers are added to the soil to promote crop growth. You should add

A. as much fertilizer as you could afford because the more you put on the crop the bigger the yield.
B. enough fertilizer to give good results and the greatest profit.
C. enough fertilizer to cover the seeds in the furrow at sowing time.
D. no fertilizer because you cannot fertilize crops unless you can irrigate as well.

B S039

The most easily leached ion in the soil is

A. ammonium.
B. nitrate.
C. calcium.
D. phosphate.

B S040

The pH of a soil is influenced mainly by

A. the organic matter level.
B. the structure of the soil.
C. the level of calcium carbonate and other bases in the soil solution.
D. a combination of texture and structure.

C S041

Which of the following soil management practices is <u>least</u> likely to improve the amount of water available on the farm for plant growth?

A. Cultivating a bare fallow (other than weed control).
B. Contour ploughing.
C. Applying a mulch to the soil.
D. Conserving water in dams to be used for irrigation.

D S042

Which factor is <u>NOT</u> greatly affected by soil temperature?

A. Rate of plant growth.
B. Seed germination.
C. The activity of micro-organisms.
D. The amount of air in a soil.

D S043

Which process does <u>NOT</u> increase the amount of plant nutrients?

A. Decomposition of organic matter.
B. Addition of artificial fertilizers.
C. Irrigation.
D. Nitrogen fixation by bacteria in the nodules of legumes.

C S044

The substances which are cycled from the soil through plants and then to animals and finally after decomposition back to the soil are

A. water and minerals.
B. primary minerals.
C. soil nutrient minerals.
D. simple organic compounds.

C S045

<u>Percolation</u> is a term which refers to

A. loss of water from soils by downward movement through the profile.
B. loss of water from soils by evaporation.
C. loss of water from soils by transpiration.
D. the movement of water through the soil from lower horizons up to the plants' root zones.

A S046

MISCELLANEOUS

Which of the following best describes the factors affecting agricultura production?

A. The soil, animal, plant.
B. Climate, animal, plant.
C. Climate, plant, topography.
D. Animal, plant, environment.

D M001

The main limiting factor to plant growth during the months of May, June and July on the Tablelands of N.S.W. is

A. rainfall.
B. wind.
C. temperature.
D. humidity.

C M002

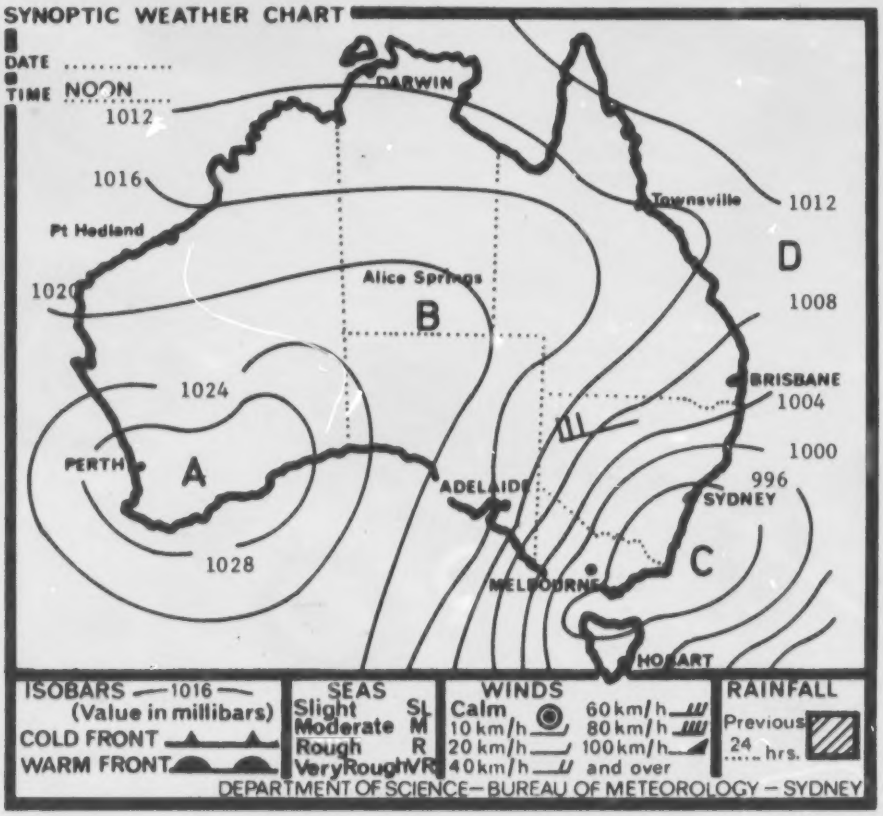
"Because of the topography, beef cattle raising is the only form of agriculture suited to most areas. The most common breeds are the Hereford and the Beef Shorthorn. The sale of timber provides additional income."

To which of the following zones of N.S.W. would the above description best apply?

A. Coastal Zone.
B. Eastern Scarp.
C. Tablelands Zone.
D. Western Slopes.

B M003

The next 3 questions refer to the diagram below.



Is the region where the pressure is highest marked A, B, C or D?

A

M004

At Melbourne the wind direction is most likely to be from the

A. North.
B. South.
C. East.
D. West.

B

M005

The symbol on a weather map is used to indicate

A. wind direction.
B. wind intensity.
C. wind direction and intensity.
D. rainfall intensity at a specific locality.

C

M006

When considering the irrigation of sandy soils the farmer is advised to

A. irrigate for short periods at frequent intervals.
B. irrigate for long periods at infrequent intervals.
C. irrigate all the time.
D. not irrigate at all.

A M007

As you travel from Sydney (Coastal Zone) to Broken Hill (Western Plains), the main climatic change you would note would be

A. a uniform increase in the frost free period.
B. a decrease in average annual rainfall from above 1000mm (40") to 250-300mm (10" - 12").
C. an increase in relative humidity.
D. less daily variation in temperatures.

B M008

Any plant or animal or other species of living things, which competes with the species being grown by man for food, fibre or other products, is called

A. a pesticide.
B. an insect.
C. a pest.
D. a pollutant.

C M009

Farm management is becoming an increasingly complex business, and many farmers are finding it necessary to consult professional farm management personnel before making far-reaching decisions.
Do you consider this to be

A. essential in all cases, because farmers are not trained to be able to make these decisions.
B. important because most farming is unprofitable and it is only by keeping up with the current development that farmers can manage to get a decent living.
C. bad, because only the successful farmers can afford such advice.
D. a good idea in many cases because it is difficult for even good farmers to be aware of new developments and trends.

D M010

H.V. McKay was important to the Australian wheat industry because he

A. experimented with improving wheat varieties.
B. invented the stump jump plough.
C. made the first combine harvester.
D. invented the sod-seeder.

C M011

During winter, cloudless starry nights often cause concern to farmers because under these conditions

A. heavy rain may fall.
B. windy weather is likely.
C. heavy frosts could occur.
D. excessive losses of soil moisture could occur.

C M012

Lines on a map joining places of similar temperatures are called

A. isobars.
B. isotherms.
C. contours.
D. isohyets.

B M013

If two sprays are incompatible they

A. do not mix properly.
B. mix well.
C. are dangerous.
D. will ignite.

A M014

The main factor preventing maize germinating in June on N.S.W. Tablelands country is

A. temperature.
B. humidity.
C. sunlight.
D. rainfall.

A M015

The next two questions refer to the data below.

RAINFALL	ORDER IN WHICH SUBSTANCES ARE LEACHED
Very light	Soluble salts Gypsum (Calcium sulphate)
Moderate	Lime (Calcium carbonate)
Very heavy	Oxides of iron

On the north coast of N.S.W. you would expect the soils to have

A. a pale grey or white A horizon.
B. an A horizon containing large quantities of salts, gypsum and lime.
C. a high natural fertility.
D. little evidence of leaching.

A M016

In far western N.S.W. you would expect to find soils with

A. a low iron content.
B. no free lime or gypsum in the topsoil.
C. little evidence of leaching.
D. low natural fertility.

C M017

The following table shows the %N (percentage of nitrogen) and cost per tonne of common fertilizers.

	FERTILIZER	%N	Cost per Tonne
A.	Sulphate of Ammonia	21	$ 70
B.	Calcium ammonium nitrate	21	$ 87
C.	Urea	46	$133
D.	Nitrate of Soda	16	$ 87

Which of these fertilizers is the cheapest source of nitrogen?

C M018

Which of the following definitions best describes the study of agriculture?

A. Agriculture is the study of all plant systems that are involved in the production of food for man.
B. Agriculture is the investigation of farming techniques.
C. The study of Agriculture involves maximising the conversion of solar energy into chemical energy in plants and animals.
D. Agriculture is the study of feeding, breeding and general management of livestock.

C M019

"During the past two decades, there has been an accelerating downwards trend in persons living on farms. There has also been a slow but steady decline in the numbers living in areas classified for census purposes as "rural". At the same time the total population has continued to increase."

The main reason for the trend described above is

A. less demand for Agricultural products hence fewer farmers are required.
B. droughts forcing farmers to leave the land.
C. better methods of production so fewer farmers are needed.
D. government action to reduce the number of farmers.

C M020

The term 'diversification' refers to

A. how a farmer distributes his farm resources.
B. the amount of money a farmer has to spend.
C. the number of different breeds a farmer has.
D. the ability of a farmer to obtain the highest market price possible.

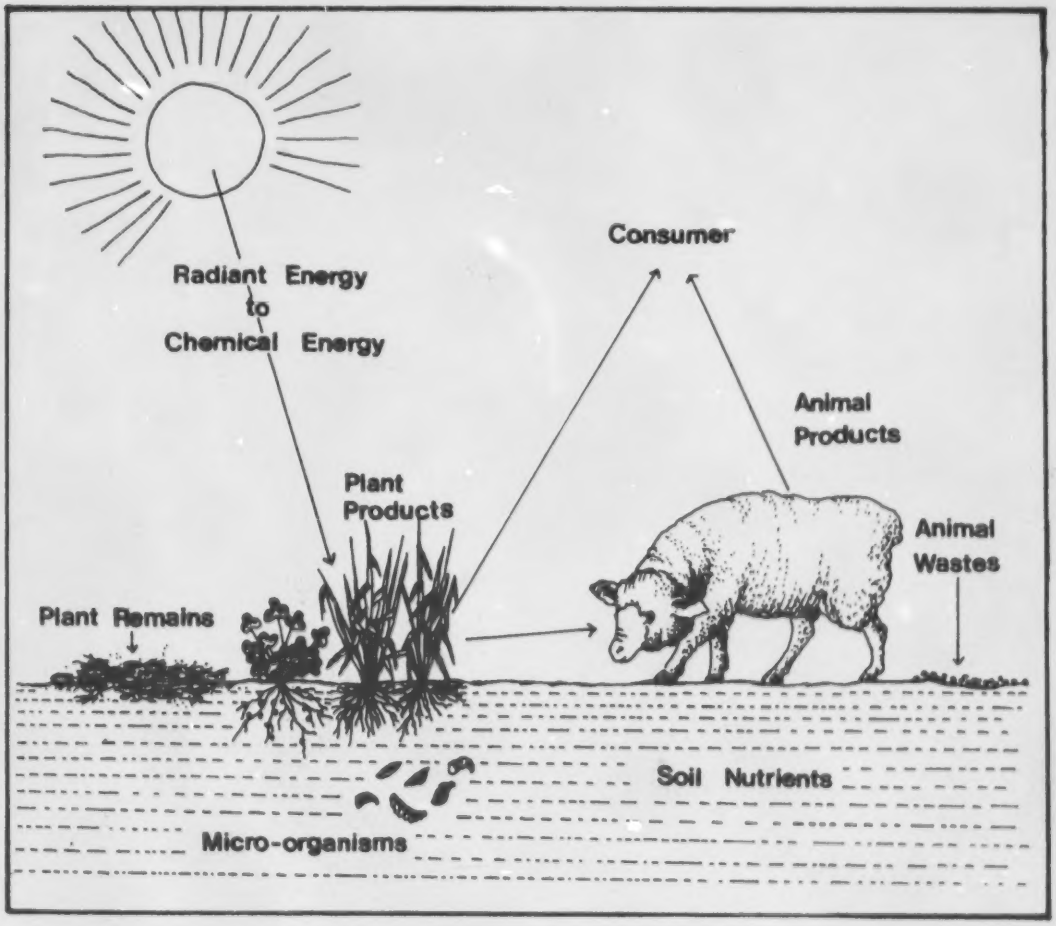
A M021

Urea is

A. a disease.
B. a fungicide.
C. a nitrogenous fertilizer.
D. an insoluble compound.

C M022

The next four questions refer to the diagram below.



The micro-organisms in the soil are important because they

A. provide the sheep with its mineral requirement.
B. supply the energy needed by the plant roots for their satisfactory growth.
C. play a major role in the breakdown of organic material.
D. dispose of toxic gases which accumulate in the pore spaces.

C M023

An important part of the nitrogen cycle that is illustrated in the diagram is

A. conversion of radiant energy into chemical energy in plants.
B. the return of plant and animal wastes to the soil.
C. ingestion and digestion of plant material by the sheep.
D. the consuming of some crops or crop products by man.

B M024

Two more questions in this set appear on the next page.

The next two questions refer to the diagram on the previous page.

If legumes were dominant in the plant population, the soil would

A. have an increased level of nitrogen available to the plants.
B. have a decreased number of micro-organisms.
C. rapidly lose most of its moisture to these high producing plants.
D. become deficient in phosphorus.

A M025

The organisms mainly responsible for organic matter decay in the soil are

A. fungi and earthworms.
B. algae and earthworms.
C. fungi and bacteria.
D. bacteria and viruses.

C M026

The purpose of research work is to

A. search realistically for solutions to known problems in agriculture.
B. apply the principles of scientific method in problem solving.
C. continue to produce problems so that employment will be available for scientists.
D. solve all the problems a farmer is likely to encounter.

B M027

ITEMS FROM THE SCIENCE COLLECTIONS.

The following 34 items are drawn from the Science Library of Test Items. They are items which are also applicable to Agriculture. They are referenced in the index under numbers SC001 - SC034.

Care should be taken when using these items to check with the Science department to avoid duplication of items in both Agriculture and Science tests.

A gardener has discovered that the soil in his garden is acidic (pH of 3.5) and he wishes to grow vegetables which tolerate only neutral conditions (pH of about 7). To enable the vegetables to grow successfully he would be wise to

A. add an acidic fertilizer to the soil.
B. add a strong base such as caustic soda to the soil.
C. burn the acid out of the soil.
D. add a neutralising agent such as limestone to the soil.

D SC001

Pollen shape and size can be as different as the flowers that produce it. Pollen may be carried by wind and also transported by insects. You would expect pollen that is carried by wind to be as

A. heavy as possible.
B. large as possible.
C. light as possible.
D. small as possible.

C SC002

Pollen that is predominantly carried by insects would be carried more easily if the flower pollen were

A. heavy.
B. sticky.
C. very large.
D. smooth.

B SC003

An orchardist may grow new apple trees by using cuttings of trees already established in his orchard. Which of the following would be true of a plant grown in this way? The new cutting will

A. be similar to the parent plant.
B. reach maturity much faster than a plant grown from seedling.
C. tend to be more resistant to disease.
D. have a better yield of fruit than the parent plant.

A SC004

Through scientific research we are able to produce more food. The most likely effect of this would be

A. decrease in animal life.
B. increase in people farming.
C. increase in human population.
D. decrease in family size.

C SC005

As a result of his study of plant nutrition the farmer now applies fertilizers to his crops.
The reason he does this is to

A. kill harmful bacteria.
B. make the plants grow taller.
C. prevent excessive weed growth.
D. put minerals back into the soil.

D SC006

Which of the following pairs of processes are the most important contributors to the cycles which keep the percentage of gases in our atmosphere at a constant level?

A. Respiration and decay.
B. Photosynthesis and assimilation.
C. Assimilation and excretion.
D. Photosynthesis and respiration.

D SC007

The centre of a heap of rotting lawn clippings or compost heap often feels quite hot because

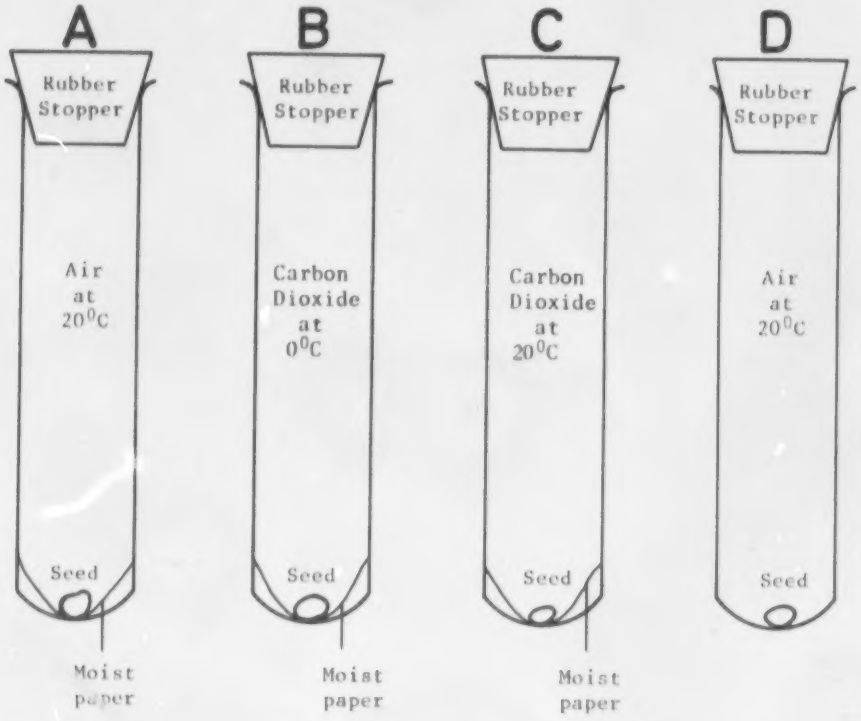
A. compression from the weight of the material on top causes heating.
B. the sun's rays on hot days causes the water in the dead grass to heat up.
C. the decomposers trap the sun's energy and convert it to food and heat.
D. heat is released in respiration by decomposers.

D SC008

A textbook states that the conditions needed for seeds to start growing are

(i) a suitable temperature
(ii) the presence of water.
(iii) the presence of oxygen.

If the above information is correct, in which of the following sets of apparatus would the seeds start growing?



A

SC009

Two green plants were placed in pots. One pot was placed in total darkness and the other left exposed to the light. The plants were given all other requirements. After three weeks each plant was carefully examined.

One difference you would expect the plant grown in the dark to show is that it would

A. be much shorter in height.
B. have more leaves in the stem.
C. have an absence of starch in the leaves.
D. have a more extensive root area.

C

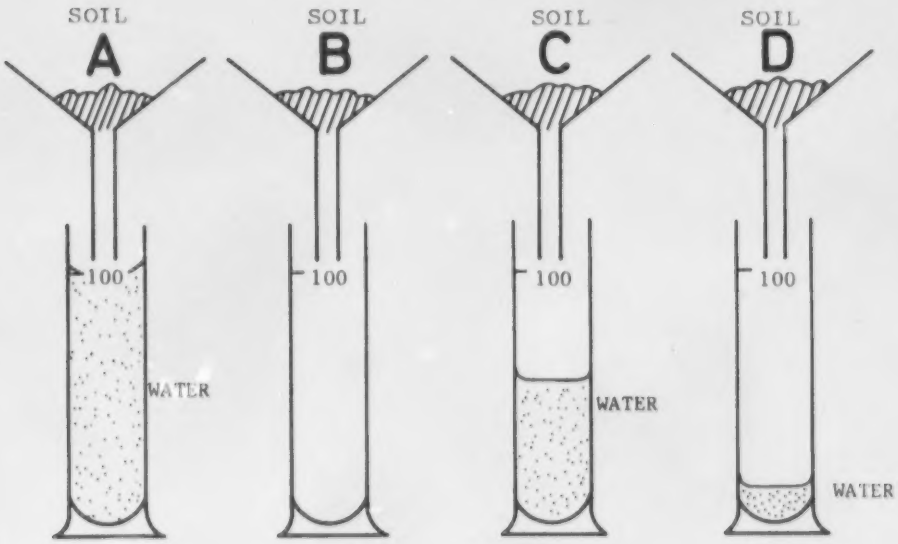
SC010

The best definition of a predator would be an animal which

A. is eaten by other animals.
B. eats grass only.
C. eats other animals.
D. eats vegetation only.

C SC011

The next question refers to these diagrams.

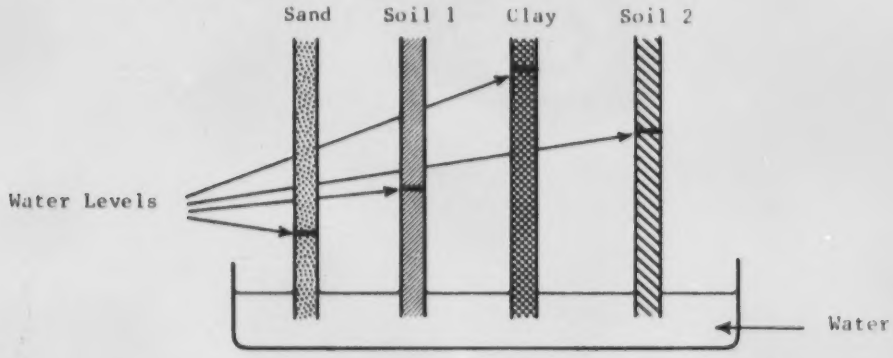


50g of four different soils (A, B, C, D) were placed in four separate filter funnels. 100ml of water was poured into each filter funnel, and the water passing through the soil was collected into a measuring cylinder as shown.
Sandy soil is known to <u>retain</u> very little water. Which of the soils above (A, B, C or D) could be a sandy soil?

A SC012

The next question refers to this information.

The diagram below shows several glass tubes containing various substances immersed in water. The height to which the water has risen is also shown.



What would be the most likely composition of soil 2 compared with soil 1?

A. Soil 2 has more clay and more sand than soil 1.
B. Soil 2 has less clay and less sand than soil 1.
C. Soil 2 has more clay and less sand than soil 1.
D. Soil 2 has less clay and more sand than soil 1.

C SC013

The tapeworm is a parasite living in the intestine of man and other animals. This organism does not have a mouth or a gut. The most likely reason for this is that it

A. absorbs food from the host organism.
B. makes its own food by photosynthesis.
C. does not require food because it is a parasite.
D. lives off its own stored food reserves.

A SC014

The Environment Protection Agency of the United States claims burping cows rank as number one source of air pollution in America! It maintains that cows burp 50 million tonnes of hydro-carbons into the atmosphere every year.
It is claimed that 10 cows burp enough gas annually to heat a small home. It is not known whether antacid tablets, if used to reduce the pollution, would contaminate the milk supply!

The information in the article

A. provides a way for solving the U.S. energy crisis.
B. is another argument in favour of margarine.
C. has little practical scientific application.
D. needs to be checked against results with sheep and horses.

C SC015

In mammals, the placenta is a structure which

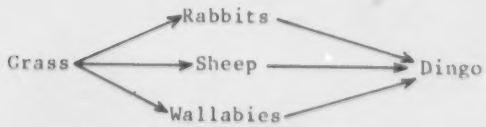
A. allows nutriment to pass from the blood of the mother to the blood of the foetus.
B. assists in the circulation of blood from the mother to the embryo.
C. connects the umbilical cord to the blood of the foetus.
D. stores the waste products from the foetus.

A SC016

Green plants obtain nitrogen compounds from the soil despite the vast reservoir of nitrogen in the air. This is chiefly because

A. animals use most of the atmospheric nitrogen near the ground.
B. nitrogen being less dense than air rises above the maximum plant height.
C. nitrogen gas cannot pass through plant cell membranes.
D. the plants cannot use nitrogen in its gaseous form.

D SC017



The above diagram shows part of the food web for sheep breeding areas of Australia.

A possible conclusion from this is that

A. total eradication of the dingo may create further problems.
B. without rabbits the dingo would die.
C. the dingo should be allowed to increase in numbers.
D. sheep are the main food source for dingoes.

A SC018

Erosion is partly due to the influence of the rabbit. Although the rabbit has caused very little damage in its native country, it has caused much damage in Australia.

This is probably because

A. Australian soil is poorly held together.
B. rabbits in Australia have evolved different burrowing habits.
C. plants in Australia are more easily destroyed by rabbits than plants in other countries.
D. with plenty of food and no predators in Australia they multiplied very quickly.

D SC019

There are two types of digestion, chemical digestion and mechanical digestion. In the mouth

A. mechanical digestion only occurs.
B. chemical digestion only occurs.
C. both chemical and mechanical digestion occur.
D. no digestion occurs as it begins in the stomach.

C SC020

Early growth of a plant from its seed is called

A. fertilization.
B. germination.
C. pollination.
D. photosynthesis.

B SC021

Biological control of a pest means using another animal or plant to kill it. This means that the controlling species is not native to the area and must be introduced. The main reason why biological control is used in many cases is that

A. if used correctly the controlling species attacks only the pest species.
B. not all the pest species will be killed.
C. no damage is done to the rest of the environment.
D. it works more quickly than poisonous chemicals.

C SC022

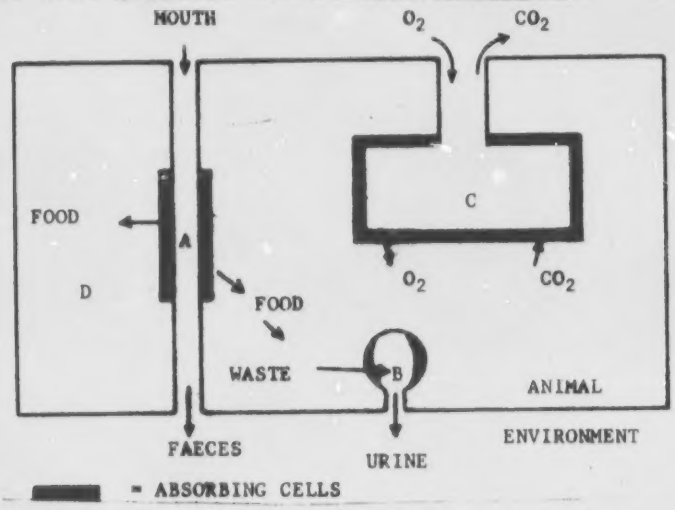
Modern agriculture is relying more and more on the biological control of pests rather than spraying or baiting.

The term biological control means that the pest is being controlled by

A. an animal that preys on it.
B. injection of special drugs.
C. burning forests where the pests live.
D. shooting with special paralysing darts.

A SC023

The next question refers to this diagram.



Study the diagram above. Which section (A, B, C or D) represents the intestine of the animal?

A SC024

The next two questions refer to the following information.

Four soils were tested to determine the amount of water which

a) stayed on the surface.
b) stayed in the soil.
c) passed through the soil.

The results, expressed as percentages were as follows

	SOIL A	SOIL B	SOIL C	SOIL D
% staying on surface	100	50	10	20
% staying in soil	0	5	20	0
% passing through	0	45	70	80

Which soil (A, B, C or D) is probably most suitable for plant growth?

C SC025

Which soil (A, B, C or D) would contain the greatest amount of clay?

A SC026

The use of DDT has been restricted in the United States. The reason for this is that DDT is

A. poisonous.
B. a cumulative poison and may affect man.
C. no longer effective on insects.
D. being replaced by more effective pesticides.

B SC027

Which of the following advertising slogans for food refers to the way your body uses the food you eat?

A. What you eat today, walks and talks tomorrow.
B. It's polyunsaturated, made from pure vegetable oils.
C. It's full of natural fibres, vitamins and minerals.
D. Made to a recipe not just a price.

A SC028

The next four questions refer to the following information.

One of the many problems faced by farmers is the continual growth of weeds in pastures. The weeds, which generally have poor nutrition value for stock (sheep, cattle, etc.), will grow at the expense of more useful stock food, if not continually checked. A method of control, which is both scientifically and economically sound, is to provide conditions in the pasture which useful grasses and clovers can take advantage of more readily than can weeds.

One such method depends on first raising the soil fertility and sowing types of grasses and clovers which will benefit more from the increased fertility than will the weeds. In this way, the weeds will gradually cover a decreasing proportion of the pasture. For example, the fertilizer superphosphate, and the pasture plant subterranean clover, have helped to combat the weed, St. John's wort.

Another method of control depends on the fact that some weeds grow quite quickly in a newly sown pasture. If two grasses, one a quick growing variety, are sown in a pasture together, the first can be harvested before the other has reached a stage of growth where it will be affected by the harvesting. However, a quick growing weed will suffer a severe setback because this harvesting will remove much of the weed plant before it has had time to seed or become firmly established.

Which one of the following facts about weeds is NOT contained in the above statement?

A. Some weeds grow quite quickly in newly sown pastures.
B. The growth of weeds is generally combatted by the planting of subterranean clover.
C. Weeds generally provide little of nutritious value for sheep.
D. The continual growth of weeds in pastures is a problem for many farmers.

B SC029

The main effect of applying superphosphate to a pasture is that it

A. lowers the resistance of St. John's wort.
B. increases the soil fertility.
C. increases the growth rate of subterranean clover.
D. restricts the growth of weeds.

B SC030

The next two questions refer to the information on the previous page.

If both quick growing and slow growing grasses are planted in a pasture then after the quick growing grasses have been harvested the slow growing grasses will have

A. only slow growing weeds to compete with.
B. no weeds to compete with.
C. only quick growing weeds to compete with.
D. both slow growing and quick growing weeds to compete with.

A SC031

Suppose there are two identical boxes of low fertility soil, one in which St. John's wort is growing, and the other in which subterranean clover is growing. If superphosphate is applied to the soil in both boxes, which one of the following is the most likely outcome?

A. The growth rate of the clover will increase but the growth rate of the St. John's wort will decrease.
B. The growth rate of the clover and the St. John's wort will both increase by the same amount.
C. The growth rate of the clover and the St. John's wort will both increase but the increase will be greater in the case of the St. John's wort.
D. The growth rate of the clover and the St. John's wort will both increase but the increase will be greater in the case of the clover.

D SC032

In using "biological control" to reduce the damage caused by a pest, the controlling organism should be very carefully studied to make sure that it

A. only kills that one pest.
B. reproduces very rapidly.
C. cannot fly to other areas.
D. has a short life span.

A SC033

Wind erosion of land surfaces is typical of

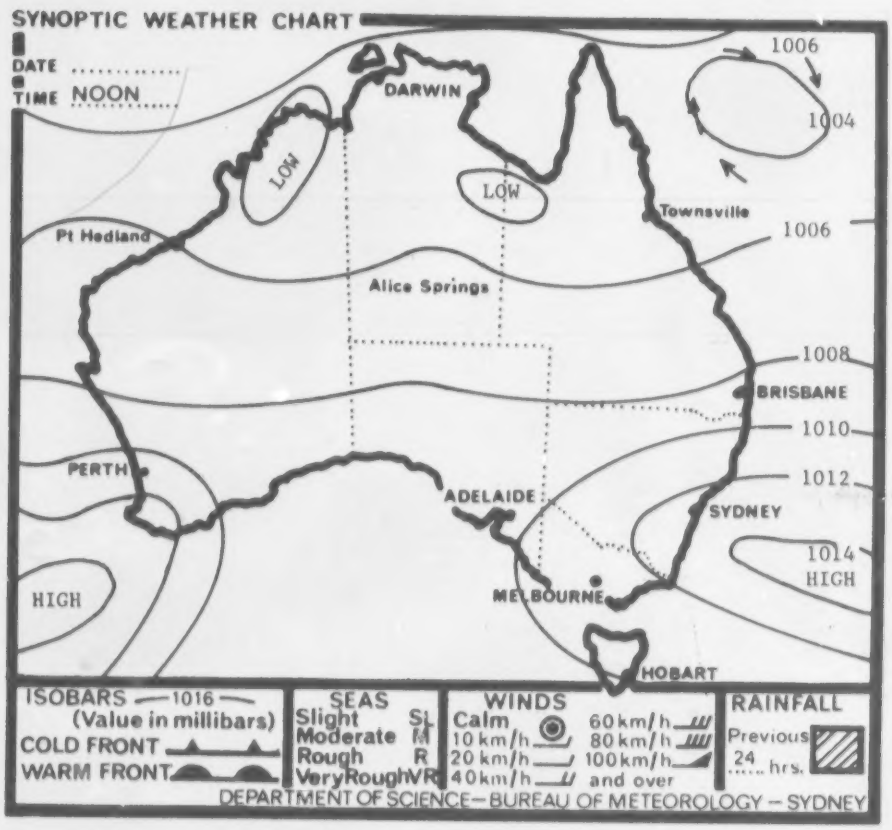
A. humid regions.
B. arid regions.
C. swamp regions.
D. lake regions.

B SC034

ITEMS FROM THE GEOGRAPHY COLLECTIONS.

The following eight items are drawn from the Geography Library of Test Items. They are items which are also applicable to Agriculture. They are referenced in the index under numbers G001 - G008. Care should be taken when using these items to check within the Social Science department to avoid duplication of items in both Agriculture and Geography tests.

The next three questions refer to the diagram below.



The isobars on the map indicate a pattern that is typical of

A. summer.
B. autumn.
C. winter.
D. spring.

A

G001

We know that the unmarked cell is a LOW because

A. the isobar is less than 1014 millibars.
B. the air is moving in a clockwise direction.
C. lows frequently form off the Queensland coast.
D. it is small in size like the other lows.

B

G002

Any winds at Brisbane would be

A. south-easterly.
B. north-easterly.
C. north-westerly.
D. south-westerly.

A

G003

"Humidity" is best defined as the

A. amount of heat in the air.
B. actual temperature in the air.
C. amount of water vapour in the air.
D. temperature of the water vapour in the air.

C G004

Which one of the following is incorrectly paired?

	LINES	JOIN PLACES OF EQUAL ...
A.	CONTOURS	HEIGHT
B.	ISOHYETS	RAINFALL
C.	ISOBARS	HUMIDITY
D.	ISOTHERMS	TEMPERATURE

C G005

A plant eating animal is called

A. a carnivore
B. a herbivore.
C. a predator.
D. an abattoir.

B G006

Plants which flourish continuously are called

A. annuals.
B. ephemerals.
C. perennials.
D. exotics.

C G007

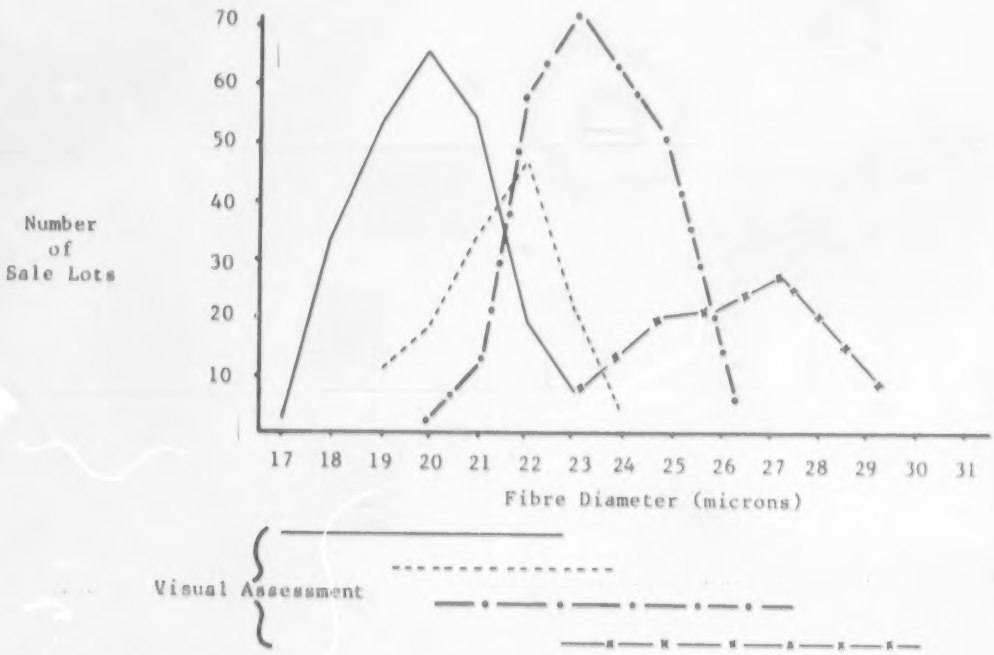
Convectional rainfall is most frequently found in

A. equatorial areas.
B. mountain areas.
C. polar areas.
D. mid-latitude areas.

A G008

ANIMALS
(continued)

Study the graphs below and answer the following question.



The graphs show that

A. visual assessment is an accurate and precise method of quality judgement.
B. visual assessment provides a quality number which has no relation to fibre diameter.
C. the number of sale lots increased as the fibre diameter increased.
D. there is a poor relationship between quality number based on visual assessment and average fibre diameter.

D A060

"Cattle have poor efficiency of food conversion." This statement means that cattle

A. must eat a lot of food to produce only a small amount of product.
B. do not eat very good quality food.
C. cannot digest cellulose with efficiency.
D. waste a lot of food by trampling.

A A061

The advantage of using pasture harrows after intensive grazing with cattle is that

A. the heavily trampled surface is loosened for fresh germination.
B. extensive manure concentration is broken and spread, thus reducing pasture souring and rank growth.
C. weed plant crowns will be split and thus weeds can be killed.
D. the sowing of winter grazing oats with a sod-seeder will be facilitated by the more even ground cover.

B A062

Pasture growth around manure pats is usually

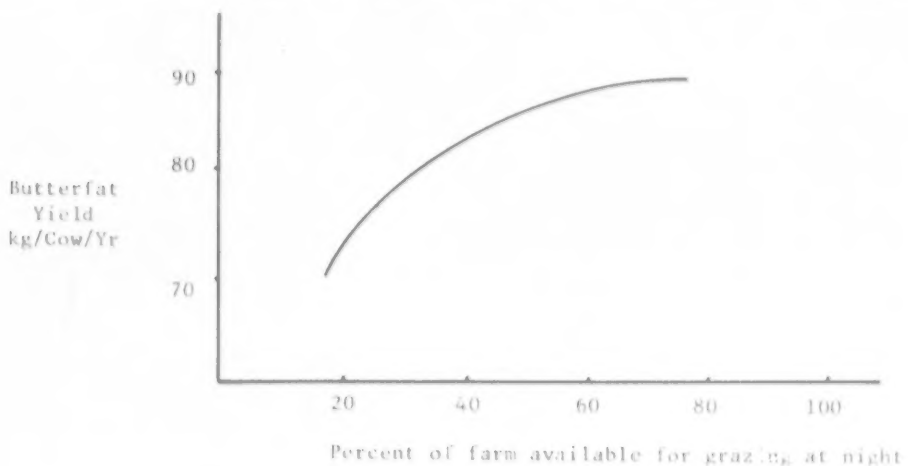
A. too rich for animals to eat.
B. rank and sour.
C. more attractive to sheep than cattle.
D. best controlled by grazing cattle before sheep

B A063

The group of micro-organisms, which are responsible for the formation of yoghurt from milk, and for the formation of nodules on legume roots, are

A. protozoa.
B. bacteria.
C. fungi.
D. viruses.

B A064



The production figures shown above indicate that

A. cows do not graze at night.
B. a farmer should yard his cows at night.
C. cows produce more butterfat if they have adequate feed at night.
D. irregular milking intervals do not affect butterfat yield.

C A065

MILK PRODUCTION ON THE EAST COAST OF AUSTRALIA

AREA	MILK PRODUCTION
Victoria, south and southwest, N.S.W.	2410 litres/cow/year
Sydney, Hunter Mid-Coast, Manning	1520 litres/cow/year
North Coast of N.S.W. to North Queensland	1270 litres/cow/year

The differences in the above milk production figures can be best accounted for by the

A. different soil types in the three areas.
B. difference in management practice in the three areas.
C. difference in quality of the cattle in the three areas.
D. effect of environmental stress, in particular heat.

D A066

The plant embryo housed within a seed replaces photosynthesis as a source of energy by

A. growing under the soil to avoid direct sunlight.
B. using water and nutrients from the soil.
C. using protein for growth.
D. using starch and oils in the rest of the seed.

D A067

The most common limiting factor in animal production in Australia is

A. poor nutrition.
B. disease.
C. poor breeding.
D. adverse climate.

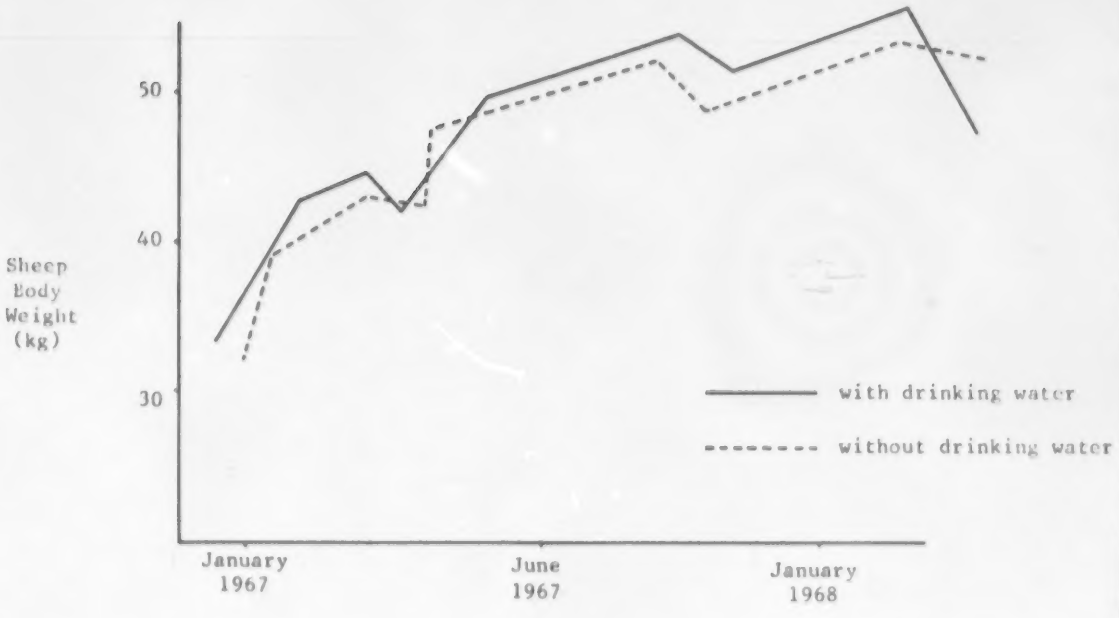
A A068

Two anatomical features of Indian or Zebu cattle breeds, which assist them to withstand high temperatures, are the

A. strongly developed hump and the floppy ears.
B. short, thick, glossy hair coat and the strong resistance to eye cancer.
C. loose skin, which increases body surface and the large number of sweat glands through which they sweat freely.
D. ability to produce less internal body heat in warm weather and the high dressing percentage, which is indicative of low body fat.

C A069

The graph below summarizes results of research into the effect of providing drinking water on the body weight of sheep.



This graph indicates that

A. providing sheep with drinking water has little effect on body weight.
B. the sheep without drinking water have significantly higher body weights.
C. sheep can live a long time without water.
D. the results seem unreasonable and should be judged invalid.

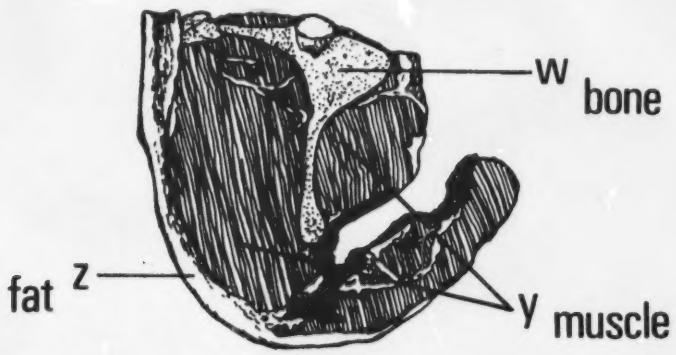
A A070

Two important benefits of crossbreeding in animals are

A. the greater vigour of growth in offspring and their general uniformity.
B. greater resistance to disease and an increase in the number of offspring.
C. a tendency for animals to be better adapted to the environment and an increase in the number of female offspring.
D. fewer genetic defects and greater fertility in the offspring.

D A071

The next two questions refer to this diagram.



The bone associated with these tissues will be strong and sound if the growing lambs are adequately supplied with

A. rock salt.
B. cobalt.
C. iron.
D. calcium and phosphorus.

D A072

During the growth stages of a lamb the component tissues of the chop (W, Y, Z) develop in a well defined order. Which of the following statements correctly lists this order?

A. Fat, muscle, bone.
B. Bone, muscle, fat.
C. Muscle, bone, fat.
D. Bone, fat, muscle.

B A073

The dairy breed of cattle with the highest percentage of butterfat in their milk is the

A. Friesian.
B. Red Poll.
C. Jersey.
D. Australian Illawarra Shorthorn.

C A074

The Fallopian Tubes are associated with

A. reproduction.
B. excretion.
C. digestion.
D. respiration.

A A075

Expenditure on carbohydrate feed for pigs can be reduced in cold months by

A. ensuring that animals do not have to produce their own heat.
B. feeding less to the pigs because they are less active when housed inside.
C. increasing the ventilation in the enclosed sheds.
D. feeding a high energy feed.

A A076

The process by which the fat in milk is broken up into fine globules that stay dispersed is known as

A. homogenisation.
B. pasteurisation.
C. curdling.
D. fermentation.

A A078

Determining the value of a sire by measuring the production of his offspring is called

A. selective breeding.
B. progeny testing.
C. line breeding.
D. mating.

B A079

The development of a pecking order in a group of fowls is an example of

A. dietary deficiency.
B. cannibalism.
C. poor management.
D. social behaviour.

D A079

If a pasture consisting mainly of an annual, seed producing grass was subjected to continuous heavy grazing, the most likely result would be

A. a slight decline in the productivity of the pasture over a long period of time.
B. that the annual grass would become less dominant and may eventually die out altogether.
C. an increase in the percentage of the annual grass in the pasture.
D. that the annual grass would flower and seed at a very early stage of its growth.

B A080

"Strip-grazing" of pastures is carried out to

A. encourage the animals to eat more.
B. reduce bullying amongst animals.
C. reduce wastage and control intake.
D. control temperamental animals.

C A081

Some flocks of commercial egg layers are Australorp - White Leghorn cross birds. The most likely reason for this is that they

A. produce eggs of better quality.
B. possess hybrid vigour.
C. are more suited to cages than are other breeds.
D. are especially suited to deep litter.

B A082

Raising of cattle in feed lots has a place in agricultural production because it

A. permits animals to be yarded at regular intervals.
B. uses a lot of grain and thus supports the wheat and coarse grain growing industries.
C. allows for more efficient feed conversion and better control of disease.
D. develops better breed characteristics which are being demanded by the markets.

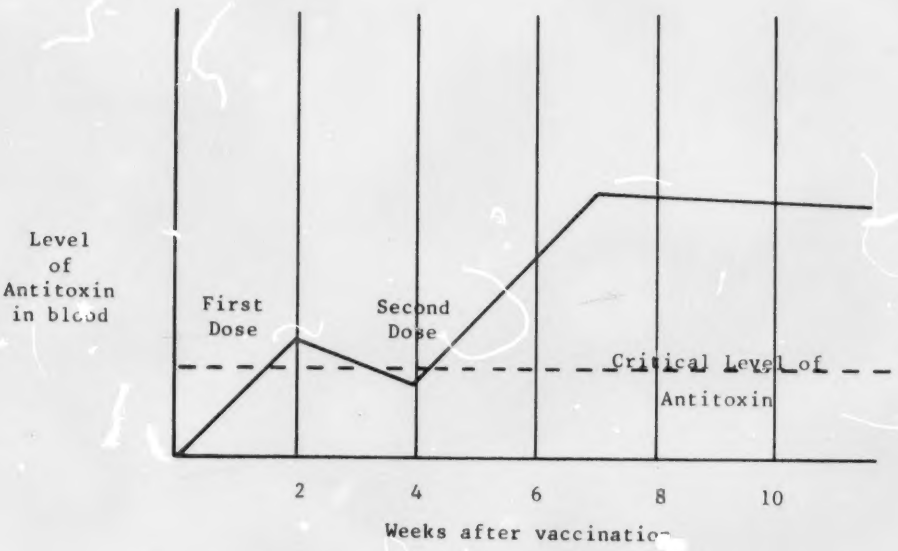
C A083

Cows are regularly returned to the bull for service on a particular farm. The most likely reason for this would be that the

A. cows are not ovulating.
B. bull is of the wrong breed.
C. cows have contagious abortion (Brucellosis).
D. bull is sterile or almost so.

D A084

This graph outlines the responses of lambs to pulpy kidney vaccination.



The graph indicates that

A. the first dose is sufficient to give immunity.
B. high immunity results from the second dose.
C. antitoxin would kill the sheep.
D. both doses could be given together.

B A085

Which of the following explains how cattle react under heat stress?

A. Dilation of the blood vessels, allowing more blood to flow near the skin.
B. Sweating and panting increase.
C. They take in more water by drinking or eating.
D. All of the above.

D A086